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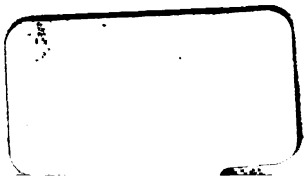

THE

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A MONTHLY MAGAZINE

DEVOTED TO THE

PRESERVATION OF HEALTH, MENTAL AND PHYSICAL CULTURE.

VOLUME XIII. JULY TO DECEMBER.

A. N. Bell, A.M., M.D., Editor,

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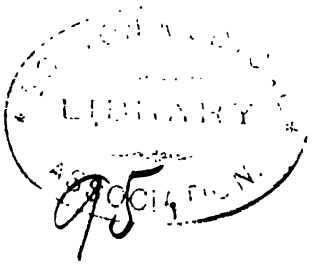

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LEPROSY IN THE UNITED STATES.*

The consideration of this disease at the present time might seem to many as inappropriate as that of the Sweating Sickness or the Black Death of the Middle Ages; nevertheless, interest in it has been revived by its recent outbreak in the Sandwich Islands, its presence in California, Louisiana, Canada, and some of our Northwestern States, in which it might be possible to include Iowa; and this must be my excuse, if any is, indeed, needed, for addressing you for a few moments on this subject.

Leprosy is, without doubt, the oldest of all known diseases. Its existence, indeed, antedates all history. Its early mention in Holy Scriptures, its incorporation into Chinese law as the second of the five recognized causes of divorce, proves the great antiquity of its existence. In the Middle Ages it was the most prevalent of diseases. In 1226 there were two thousand leper hospitals in France alone, and nineteen thousand of them in Europe. They were in all parts of England and Scotland.

Leprosy has almost entirely disappeared from Europe—the last indigenous case in Scotland dying at the beginning of this century. It lingers, however, in some isolated spots, notably

* Paper read before the Iowa State Medical Society by R. J. FARQUHARSON, M.D, Secretary of Iowa State Board of Health, at its annual meeting, held at Des Moines, May 21, 1884.

in Norway, where, a few years since (1856), there were two thousand cases, and which locality is the source of our supply.*

In Keith Johnstone's Map of the Geographical Distribution of Diseases, a copy of which may be found in Blythe's Dictionary of Hygiene, North America is the only one of the great divisions of the earth in which leprosy is not marked. But the disease existed here, in Canada, the Northwestern States, Louisiana, and in Mexico. In Louisiana it existed more than a century ago, being noticed in Romaine's History of Florida (1776); and in 1785 a hospital of lepers was erected in the vicinity of New Orleans, the site of which bore the name of "The Leper's Land"—(*la Terre des Lepreux*)—for many years after the destruction or decay of the buildings. The disease was then common among the negroes, and was, in all probability, brought from Africa, where it has always existed. Indeed, in 1850 Dr. Joseph Jones saw a case of leprosy in Georgia, in the person of a native African. But it is a singular, if not significant fact, that in 1880 all the sixteen cases observed by Jones on Bayou La Fourche, and all the recorded cases treated in the Charity Hospital of New Orleans, were whites. Certainly there can be no question of heredity here.

Leprosy was introduced into the Province of New Brunswick, Canada, at Tracadie, near the Bay of Chaleur, in 1820. How and whence is not known. There are a few cases there now, and a leper hospital is maintained. Dr. Graham, of Toronto, visited this quarter last summer (1883), and gives the following as the result of his observations:

1. "The origin and early spread of the disease cannot be explained on the theory of hereditary transmission, although this theory may account in part for its further propagation.

2. "Although endemic influences, such as mode of life, diet, etc., may be strong predisposing elements, they are in no case the sole cause of the disease.

3. "Leprosy in Tracadie was *imported from without*, and finding favorable conditions, was propagated from one person to another by *contagion*." [The italics are mine.—R. J. F.] —(Leprosy in New Brunswick, J. E. Graham, M.D., Montreal, 1883.)

* In Norway, in 1872, with a population of 1,756,965, there were total deaths, 29,417; from leprosy 120, or 4 per 1,000.

In the Sandwich Islands leprosy was introduced about 1843, from China, probably. In 1865 a leper hospital was established on the island of Molokai, where, at the time of Dr. Tryon's visit, eight hundred and six lepers were found. Some time in 1882 Dr. White, of the United States Navy, visited the Sandwich Islands and reported as follows:

"Leprosy seems to be on the increase. To the two per cent. of the total population of 58,000, known to be affected and now under government care on the leper island of Mokolai, or 1,161, an estimate of three per cent. more is added of concealed cases, by persons who claim to have some knowledge of the subject, making a total of 2,856 cases of leprosy."

From this it appears that here we have a marked exception to the general rule of the decrease of leprosy throughout the world.

In regard to the prevalence of leprosy in Norway, Dr. Damilson, of St. George's Hospital, Bergen, reports twelve hundred cases in a population of two hundred thousand, on the coast of Norway, equal to six-tenths of one per cent. As to its decline the statistics show:

1856.....2,113 cases.
1874.....1,832 "
1878.....1,681 "

VARIETIES OF LEPROSY.—The latest writer (Erasmus Wilson, in Quain's Dictionary of Medicine, Art, Leprosy) divides the varieties of the disease as follows: Elephantiasis (Græcorum), Elephantiasis tuberosa, and Elephantiasis anæsthetica; with a sub-variety, as Elephantiasis nodosa, or Elephantiasis mutilaus.

PATHOLOGY.—Leprosy is classed by pathologists among the "infectious granulation tumors (Virchow), three of which—tuberculosis, glanders, and leprosy—are now known to have characteristic bacilli, and the fourth—syphilis—is suspected of having such.

The morbid anatomy of leprosy shows a thickening of the neurilemma of the nerves, and a separation of their febrillæ by a dense cellular deposit; and a similar cell infiltration in the leprous tubercles. This condition, although always found in leprosy, is not peculiar to that disease—being found also in bucnemia, lupus, glanders and syphills; hence, many eminent

pathologists, including Virchow and Hebra, think this condition to be merely a symptom and association, the distinguishing pathological feature of the disease remaining yet to be discovered.

BACILLUS LEPRÆ.—The "bacillus lepræ" is described as a very delicate rod, about one-half the length of a red blood disc, and one-fourth as wide as long, tapering at the ends. The rod may be thickened by several nodosities—the spores (Gradle, p. 192). They have been successfully cultivated, but all attempts to produce the disease in other animals have failed.

CAUSES.—As the disease prevails all over the world, among all races, in all climates, at all elevations above the sea level, among all classes and conditions of society, from the highest—including kings—to the lowest, and among those subsisting upon the most varied kinds of food, it might be rightly conjectured that it has been assigned, without much satisfaction, to many different causes. Erasmus Wilson is inclined to attribute it to marsh exhalations, and after mentioning some observations looking this way, says: "The writer could multiply cases of this kind considerably, and has had the conviction forcibly borne in upon him that the cause of leprosy is miasma. No other cause is of such general distribution, suiting every climate and every part of the world unless it be such countries as have been relieved of the cause by land culture and improvement."

MODES OF PROPAGATION.—The consideration of these may be at once reduced to two—contagion and hereditary transmission; and, in all probability, leprosy, like its congener, syphilis, may have both.

In New Brunswick, although heredity was the common mode of transmission, yet in Dr. Graham's report there are cases which cannot well be explained without calling in the aid of contagion.

Again, among the cases reported by Dr. Jones, from Louisiana, is one so marked that I cannot refrain from briefly alluding to its peculiar features.

Father Boglioli, native of Italy, aged 66, came to the United States in 1840, at the age of 26. Has had yellow fever, and been most of the time in New Orleans and Louisiana. For fourteen years was priest to Charity Hospital. He gives the following

opinion as to the origin of his disease: "In 1879, administered extreme unction to two cases of leprosy, rubbing their hands with oil, etc. Also, had attended several other cases of leprosy, in his capacity of religious adviser and pastor, in the male and female wards."—*Charity Hospital, New Orleans*, 1879.

Erasmus Wilson says of contagion, in speaking of the introduction of leprosy into the Sandwich Islands by Chinese emigrants in 1848, and its rapid increase, and, commenting on this significant fact, gave it as his decided opinion, "that, though leprosy was, under ordinary circumstances, non-contagious in Europe, it was probably contagious in tropical and semi-tropical countries."—(*Dr. Liveing-Goulstonian Lectures*, 1873, *p.* 92.)

The presence of a peculiar bacillus is also a strong presumptive proof of contagiousness, or leprosy must be a strange exception to its kindred: glanders, tuberculosis, etc. But leprosy is not contagious in the ordinary acceptation of that term. It requires an absolute inoculation of pus or blood into the circulation through open vessels or abraded surfaces, and at the same time it is assumed that we must have the cachectic conditions favorable to the action of the virus.

Cohabitation is equally a cause of infection, the local conditions of absorption being the same.

"Vaccination (*i. e.*, human, as practiced in the Sandwich Islands in 1853)," says Dr. Wood, U. S. Navy, 4th Rep. Navy Dept., 1879, "is a means of inoculating the system with leprosy." The same author states that the dressers in the hospitals of Calcutta, and other portions of the East, positively free from hereditary disease, have in many instances developed it under circumstances connecting the inoculation with their duties. Dr. Robertson, superintendent of the leper house in the Seychelles Islands, became a leper during the period of his connection with that institution.

DIAGNOSIS.—In this branch of the subject we will first consider the various diseases with which leprosy has at times been confounded. In the Bible, the leprosy of Naaman, Gehazi and Moses was not the true disease, but leucoderma, or morphœa alba. These diseases are known as white leprosy, a disease quite prevalent at the present time in India, where, strangely enough, it is called "Jewish leprosy."—(*Liveing*, *p.* 146.)

Dr. Carter, in his report on leprosy, 1872), says: "White lep-

rosy is everywhere found. Perhaps 1 person in 1,500 in the whole Bombay Presidency is affected by it." It differs from leprosy in being essentially a local disease, and often unilateral.

Another disease confounded with leprosy, even in the Bible, is bucnemia, or Barbadoes leg. This confusion exists in modern times, perhaps, in a great degree, from the confounding Elephantiasis Græcorum and Elephantiasis Arabum. The distinction is easy, however—one has a bacillus, the other a filaria, if not as a cause, yet a constant attendant.

Leprosy has been also confounded with yaws, but only among negroes.

Syphilis is the disease with which leprosy in this country is most apt to be confounded; and I would beg any of our members residing in the northern counties of this State to narrowly watch among their patients for symptoms of secondary syphilis, especially of an unusual or abnormal kind. This request will seem pertinent and reasonable when they consider the chronic nature of leprosy and its consequent easy concealment; and also when they hear the researches made into history in this State, and the surprise of even the oldest practitioners, to find that it had prevailed, and deaths occurred from it among the people of their neighborhood, without even the suspicion of the existence of such a state of affairs.

Dr. White, of Boston, says:

"Take my own single experience. One of the Tracadie cases escaped from the lazaretto (in New Brunswick, Canada,) twenty-five years ago, and was for a considerable time a resident of Boston, under an assumed name. He was under my charge for months at the Massachusetts General Hospital. There has died during the past year under my care one of the Louisiana lepers, from the Plaquesmines district."—(*Am. J. Med. Sci., Oct.*, 1882, *p.* 447.)

LEPROSY IN IOWA.—Last summer I was a good deal surprised by the receipt of a request directly from Dr. Frederick Ekland, of Stockholm, Sweden, and also from him through the National Board of Health, to furnish him with details of cases of leprosy in this State. Never having heard of the existence of a case in this State, I so replied, asking him for the source of his information. Later, I received an answer, stating

that it was from the published statements of Dr. Holmboe, who visited this State in 1863, and of Prof. Boeck, the date of whose visit was 1870.

My next step was to write a letter to the Rev. L. A. Johnston, pastor of the Swedish church in Des Moines, and from him had the following answer:

"In reply to your letter, I can say that I have never heard of a case of leprosy among the Swedes or Norwegians in Iowa, or in any other State in America, or elsewhere."

As both Holmboe and Boeck located cases in Winneshiek County, near Decorah, I asked Dr. Small, health officer of that city, to investigate the matter, which duty he very promptly performed. The result of his researches being shown in the following extracts from his report of the date of August 29, 1883:

He begins by stating that though he had practiced medicine in Winneshiek and the adjoining counties for twenty-seven years, yet he had never heard of a case of leprosy. Interviews with prominent Norwegians in the town of Decorah yielded no information. Finally, he got a clue from T. E. Egge, the County Auditor, who remembered that, when he was a boy, Dr. J. A. Holmboe and Rev. Mr. Koren, of Bergen, Norway, visited his father in search of cases of leprosy.

The Rev. Mr. Koren being still alive, Dr. Small paid him a visit, and from him had the following interesting information: "Dr. Holmboe visited this country in 1863, and made a tour of inspection in regard to leprosy among Norwegians. Both Dr. Holmboe and Rev. Mr. Koren were familiar with the disease in the hospital erected in Bergen 200 years ago. Johannes Simonsen was pointed out, whom both gentlemen knew in Norway (this is Holmboe's second case), but he is now living, 75 years old, in good health, and has never had any symptoms of leprosy, nor has any of his family.* Dr. Holmboe saw, in 1863, the death here of one man, supposed to be Knab. Ericsen (Holmboe's third case). Dr. Koren had in his congregation a case of leprosy, a certain N. W. Remene, who died April 6,

* There is some mystery here, for Dr. Holmboe knew leprosy well, and therefore could not have been mistaken; neither could the patient have recovered—such an event being unknown. The mistake arises from the unfortunate repetition of the same names, both Christian and surnames, among the Scandinavians.

1877. He had lived in this country fourteen years before the disease made its appearance. He was a horse-driver in the West, camped out and lived on poor food; none of his family, however, have been since affected.

Finally, the reverend gentleman stated that for thirty years he has traveled over all of Northern Iowa and Southern Minnesota, and, with these exceptions (four cases), he has neither seen nor heard of any other cases of leprosy; and it is his opinion, as it is also of Dr. Small, that there is not a case of the disease in Northern Iowa or Southern Minnesota."

Of the eighteen cases of leprosy observed by Prof. Boeck in 1869–70, three were in Iowa.

1. Edward Nielson Taraldsgaard, Hesper township, Winneshiek county; then (1869) 23 years old; two years in America; brought the disease with him from Norway.

2. Ole Torkildson Fosse, Pleasant township, Winneshiek county; then (1869) 30 years old; disease appeared three and one-half years after his arrival in this country. Had, in Norway, leprous relatives.

3. Ole Iverson Dale, Winneshiek county; then (1869) 43 years old; brought the disease from Norway, does not know of any leprous kin.

This information is derived from a special report of Dr. Grönvold, of Norway, Minnesota, dated Sept. 1st, 1883, a copy of which Dr. Hewitt, Secretary of Minnesota State Board of Health, was kind enough to send me.

The cases are tabulated thus, all being in Winneshiek county:

AUTHORITY.	YEAR.	TOWNSHIP.	NO.	NAME.
Holmboe.....	1863	Madison,	1	Ljar Petersen.
"	"	Union Prairie.	2	Johannes Simonsen.
"	"	" "	3	Knab. Ericsen.
Koren	1877	———	4	N. N. Remene.
Boeck	1870	Hesper,	5	Edward Neilson Taraldsgaard.
"	"	Pleasant,	6	Ole Torkildson Fosse.
"	"	Madison,	7	Ole Iverson Dale.

It thus appears that in the past twenty years there have certainly been in Iowa seven cases of leprosy, all now dead, the latest dying April, 1877.

Winneshiek county, in 1880, with a total population of 23,-

938, had a foreign population of 7,862, of which 4,095, or 52 per cent., were Scandinavians (Swedes and Norwegians). The whole State had then 39,145, so that of the Scandinavian population of the whole State, Winneshiek county had about ten per cent.

As yet we have no knowledge of the existence of the disease in a child born in Iowa, but that such an event is possible Dr. Hyde's report of a child born in Minnesota, of Swedish parentage, the father having leprosy in the tubercular form, affected with the disease, shows.

Many persons may think the danger of the spread of leprosy in this State is small, but as Dr. Billings significantly remarks:

"The danger is, no doubt, small—that is to say, there is a very small risk of a very small danger—but it exists, and now is the time to guard against it."—(*Lectures on Germs, San. Eng., March* 29, 1883, *p.* 388.)

APPENDIX.

MINNESOTA.—In this State Boeck saw four cases in 1870. In 1878 Dr. Grönvold reported four cases; two dead, in 1878 (one of Broeck's cases), and two living.

Circulars were sent to Norwegian physicians and clergymen, and twenty answers were received from eleven counties. Only two cases of leprosy were reported, both of the anæsthetic form, and both natives of Norway. One of these cases had the disease in Norway, but was first seriously attacked seven years after coming to this country, nine years ago. He has grown children—all well.

Dr. Grönvold knows of three cases in his vicinity—Holden, Goodhue county—one male and two females. All brought the disease from Norway. Two have children and grandchildren, all well. In the past ten years five lepers have died in his vicinity; but in one of these (Boeck's No. 2) the disease had stopped years before his death. Of these five lepers two were married and have children and grandchildren—all well. He has in the same period other cases in transient persons, but has lost trace of them. He thinks there are other cases in the State, but admits the difficulty of discovering them, owing to the great disinclination, both on the part of the patients and their relatives, to confess the existence of the disease.

Of Boeck's four cases in this State, Nos. 2 and 3 are dead. No. 1 is yet living. The other cannot be traced.

As leprosy is steadily diminishing in Norway, as immigration is its only source, it must decrease here also. In Norway there were, in 1856, 2,113 lepers; in 1874 there were 1,832; in 1878 there were 1,681.

WISCONSIN.—Of leprosy in this State, where Boeck saw nine of his eighteen cases, the only information I have been able to find is in a letter of Dr. J. T. Reeve, Secretary of Wisconsin State Board of Health, to the *Sanitary News*, dated August 27, 1883, and published September 15, 1883, in which it is stated that Dr. Knut Holgh, a member of the State Board, has, since 1869, been investigating the subject, and in the fourteen years has seen but four cases, two of which, if not all, are now dead.

ILLINOIS.—Of leprosy in this State, where Boeck found two cases, I can find no record.

PHYSICAL PURIFICATION.*

In speaking, a few months ago, on one of the departments of physical purification, I seem to have startled the proprieties of many of the people by the assertion that absolute cleanliness—cleanliness of the body and mind, and all that belongs to them—is the beginning and the end of the sanitary design, and that such perfect cleanliness would wipe off all the diseases which cause at this time the leading mortalities. I do not withdraw from that statement a syllable, and I again place this subject of national purification first on the paper.

Into all the varied studies connected with this argument it were impossible to enter. It will be fittest to take two of the Augean stables which have to be cleansed.

Underground Purification.—The complete removal from our communities, day by day, of all their organic excreta, is still an unsolved difficulty, which, remaining unsolved, is a block to every step of perfect purification.

We are yet distracted with the debate ever going on be-

*Abstract of paper on Vital Steps in Sanitary Progress, by Benjamin Ward Richardson, M.D., F.R.S., read before Society of Arts and published in the *Journal* of the Society.

tween the advocates of the combined and the separate systems of drainage. Shall our organic excreta go with the storm-water into the river and sea, or shall the water go to the river and sea, the sewage to the land? Unlike our neighbors on the other side of the channel, we have agreed to give up the cesspool and to divide on two questions which they have not, seemingly, admitted, and one of which—that of disposal in running streams—they have long legally prohibited. But in giving up the cesspools, have we greatly advanced, so long as we pollute the running stream and lose the natural fertilizer of the land?

Looking back on all the controversy for the last thirty years, and reading back still farther, I feel we have not advanced. I do not think it would be wise to return to the most scientific system of cesspoolage, but I cannot conceive any next worse plan than the plan of passing the sewage with storm-water, even on the most scientific system, into running streams, and robbing the land of its greatest requirement for its fruitfulness. I submit, therefore, as a point to be argued out, that this society can never be soundly assisting sanitation until it assists none other mode for removal of excreta than the separate system.

In saying so much for the separate system I do not, however, wish to contend for the introduction of that system in the hard and unchanging line which some would fight for. I know quite well, from the inspections I have had to make, officially, of different towns and districts, that there are centres of population in which the separate plan, in its rigid application, is not suitable. A town may have no river into which its storm-water can run. A town may have a river but no land near to it which can be cultivated.

These conditions may affect details, while they need not affect the principle. For storm-water for which there is no natural outlet there is always the good resource at hand of storing it for domestic use. For sewage that cannot be utilized on land near to the community which yields it, there is always land not far away which is waiting for it. In these days there need never be necessity for any difficulty in the removal of sewage day by day from the largest centres of population, presuming always that it is not mixed and increased in volume by storm-water.

Closed sewage-tanks movable by night train, closed sewage-tanks movable by steam-power on sewage canals and rivers, closed tanks movable by steam-power on the sea, could convey away all this product for fertilization, and deposit it where it could administer its full benefits to the earth. Barren portions of our seacoast could, by these modifications of the separate system, be made the most fertile and beautiful of all our tracts of vegetation.

To the engineer, when once a system were decided on and declared, these modes of transit and many improvements on them would occur. With the engineers it is not our special province to interfere. They exist to carry out what had been determined on, and when they know what the people want they will do what is wanted as surely as they will lay down, after the country had said they must, a new railway or a telegraph. We have but to declare the principle, and get it fixed, that every town in England must be cleansed of its organic excreta out and out, day by day, as certainly as it is supplied with the food that is brought into it, and the thing will be done.

Toward such perfection any powerful society, steadily and resolutely devoting itself, would soon be backed up by the common sense of people who require but a competent instructing authority in order to understand the subject accurately. The utter failure of the combined system as a permanent solution of the drainage difficulty, and as a mere transition from the cesspool to the method of removal, day by day, combined with immediate and fruitful utilization, is of itself becoming apparent with such swift conviction that it will come, whether assisted or not by our will and deed. But it were wise to hasten it, and it is one of those pressing practical things which we could hasten effectively if, irrespective of all interests but true ones, we laid ourselves out for the duty.

At the instance of Mr. Edwin Chadwick, whose name as a sanitarian is a name of the century, we did some time ago commence an inquiry here bearing upon the vital point now under consideration. We opened—or, more correctly speaking, re-opened—the sewage question, and we discerned all at once, although our inquiries were entirely confined to limited areas of London, so much evil that we rather abruptly closed the

evil up again as if we were frightened at it It is all in vain; for sewage, like murder, will out, and we must once more proceed. What we did discover was, in truth, so serious that the wonder we labor under is, how London can be so healthy as it is. We found that London is still honey-combed with what are in fact, if not in name, cesspools, a fact we all practically recognize by the second-hand measures we take to meet the primary blunder.

From the window at which these remarks are written, I see that one of my neighbors, the owner of a large house in our square, has carried out of his house from the basement a three-inch tube to above the level of the parapet, in order to deliver into the air any gases that may accumulate in main drain of the residence.

It is not good for the air which I and many others have to live upon, that it should receive the foul air which rises from the decomposition of my neighbor's organic excreta; and if everybody's neighbors did it, it would be detected in some weathers, so that the process must be stopped as it was in a former day on a recommendation of the Royal College of Physicians. I do not, however, blame my neighbor for what he has done, because I have done it myself. It is a natural species of self-protection amongst those who know best how to protect themselves. My contention is, that the necessity for any such method is proof demonstrative of the rottenness of the primary system which causes the necessity, and which, keeping us foul beneath our houses, makes the air, at its best, foul also above them. My contention is that the decomposition from accumulations of sewage, which gives origin to the gases that are let out by thousands upon thousands of channels, by tubes from houses, by soil pipes within houses, by accidental openings and pores in all directions; by gullies in streets, by great outlets of sewage, ought never to have been generated at all, but that the sewage, removed clean away hour by hour, many miles from the community, without having decomposed either above or below the living place, should never infect the place nor have any destination except the land which is calling for it and dies if its demands be not naturally supplied.

The moment we can, by the skill of our engineers, get our in and out going drainage system as good as our railway sys-

tem, as true in its working, as continuous and automatic, the most important of all the basic sanitary reforms will have been introduced. Without any stretch of the imagination, volumes might be written on the affirmative side of this proposition. I must be content to put the negative side. I must declare on all heads of experience and observation, that until the basic reform is carried, there can be no sound sanitation at all. I have asked many times, sought many times for so much as one instance in which the combined system—apart altogether from its loss and extravagance, which might be tolerated if its results were good—has proved a sanitary success. I cannot find one instance of the kind.

The towns which depend on storm-water to flush and inundate their sewers are like the old mariners who depend on favorable weather for a favorable voyage. The day has passed for that, as it has for a system of sewerage which at all costs must be swept away.

TRICHINIASIS ABROAD.

In view of the recent attitude of M. Paul Bert upon the subject of trichiniasis, and his extraordinary statements before the French Chamber of Deputies and their action thereon, the following may not prove uninteresting to our readers. M. Bert has been charged, not only in this country, but in France, also, with improper motives, and as being not altogether unbiased by outside influence in his arguments. The astounding statements made by that gentleman may not be known to many of our readers, and it may be well to give an idea of them by quoting from an editorial in the New York *Medical Journal* of Jan. 29th: "Contrary to the general impression in France, M. Bert suggests that trichiniasis is not uncommon in that country, and he accounts for the error of those who think differently by maintaining, in substance, that the disease often passes unrecognized, being taken for typhoid fever."

This and other statements are thus disposed of in the editorial in question: "He (Paul Bert), has nothing to oppose to M. Brouardel, and M. Granger's report; he does not contest

the Andalusian origin of the outbreak in Malaga; he is silent with regard to Virchow's statement as to the non-occurrence of trichiniasis of American origin in Germany; he deals in nothing but his own assertions." Nevertheless, acting upon the statements of M. Bert, the French Chamber, ignoring completely the report referred to in the following article of M. Vallin, and the report of Brouardel, and accepting the unsubstantiated opinion of M. Bert, prohibited the importation of American pork. The hint thrown out in the following article, that the action of the Chamber was based not upon "motives of a scientific nature," but upon those of "political economy," will undoubtedly be the conviction in the minds of all right-thinking persons." This article is taken from the *Journal de Médecine et de Chirugie Pratiques.*

The question of trichiniasis has recently attained a new interest on account of several epidemics which have occurred in Germany, and also by reason of several incidents which have taken place before the Chamber in regard to this question. We take from an article in the *Revue d'Hygiene* some interesting details relative to the epidemic at Emersleben, a small village of seven hundred inhabitants, situated in the Hartz mountains, an epidemic which gave rise to 250 cases of trichiniasis, with 50 deaths. The Minister of Commerce had charged MM. Brouardel and Granger with a mission to the infected locality for the purpose of investigating the causes of the diseases, the part taken therein by American pork, and the measures of inspection and prophylaxis, which have been enforced for several years in Germany. The result of their inquiries is the subject of M. Vallin's article.

The origin of the diseases was found to be in an indigenous hog, the meat of which was examined by two inspectors who found no trichinæ, but who were, perhaps, not in a condition to make a thorough examination. Both of them ate of the meat of this animal and became sick. Besides, it was possible to follow up day by day the persons who had eaten of this meat. This meat, which was hashed, was consumed raw for eight days; of those who ate of it while it was fresh, in the three or four days following the killing of the hog, a larger number were affected than of those who commenced to eat the meat towards the sixth or seventh day. It was thus that the

proportion who died was 33 per cent. in those who ate of the meat upon the second day, while it was not more than 10 per cent. in those who ate on the fifth day, and fell to 0 in those who did not eat until the seventh or eighth day. It seems, therefore, that the trichinæ lose their vitality and die rapidly in hashed meat, even without its being smoked or cooked; the danger being greater in proportion to shortness of time after killing.

The study of this epidemic has also demonstrated that of all the persons who ate the meat, baked or boiled, not one was affected, while those who became sick ate it raw. A light heating, a baking of five minutes, sufficed, as several cases proved, to render the meat harmless. But in Germany it is a common thing to eat hashed pork spread upon bread just as we eat preserves. Therefore it is easy to understand why trichiniasis is more frequent in that country than with us.

Finally, this epidemic had its origin in an indigenous hog, inasmuch as it was raised there, and the importation of American pork had nothing to do with it. Besides, Prof. Virchow has stated that there never was known in Germany a single authenticated case of trichiniasis which could be truly imputed to American salt meat.

It is known that upon the report of M. Brouardel, the decree prohibiting the importation of American pork was raised, but that the Chamber did not ratify this latter decision, inasmuch as the prohibition is maintained, at least temporarily. In the discussion which led to this decision, motives of a scientific nature were brought forward. But in presence of the known facts in regard to the inocuousness of this class of meat, motives are of no value. It may be said that it was the political economy side of the question which played the only part, inasmuch as it was so stated by several speakers who took part in the discussion, and in all likelihood these are the motives which will influence the promulgation of a final law upon this subject.

Whatever may be the ultimate decision upon this point, the study of this epidemic demonstrates once more that indigenous hogs, those of Germany, and above all, of Russia, are more dangerous to us than American hogs; that our methods of cooking, if followed, will put us beyond danger of the disease, and as has been very well said by M. Colin, before the Academy,

three years ago, it is in the kitchen that war must be made against trichiniasis.

L. F. S.—*New Orleans Medical and Surgical Journal.*

CHROME YELLOW AND CELESTIAL BLUE AS A BREAKFAST REPAST.

Health Commissioner Raymond, of Brooklyn, recently held an investigation of a new polishing process by means of which certain enterprising persons, calling themselves merchants and manufacturers, undertake to transform inferior grades of coffee into Java.

The proceedings were opened with the reading of a report prepared by Dr. Elias E. Bartley, chemical analyist of the Health Department. He had with him samples of the coffee which he had taken from the two firms—the "New York and Brooklyn Company," and the "New York and Baltimore Coffee Polishing Company."

The report was as follows:

BROOKLYN, May 17, 1884.

To the Commissioner of Health:

DEAR SIR: I have the honor to report the following result of my investigation into the coloring matter used by the New York and Brooklyn and New York and Baltimore Coffee Polishing Companies, situated on Furman street:

On visiting the works of the New York and Baltimore Company the following coloring agents were found and samples of each were taken and are still in my possession:

French chalk—White, also called soapstone or talk, is a silicate of magnesia.

Gum arabic.

Charcoal from wood.

Drop black—Animal charcoal or burnt bones.

Yellow ochre and a mixture of clay and hydrated oxide of iron. Venetian red, a red earth mostly oxide of iron and clay.

Chrome orange—Chromate of lead mixed with yellow ochre (poisonous).

Burnt umber differs very little from ochre in composition.

Celestial blue—A mixture of ochre and Prussian blue gives off cyanogen abundantly in heating.

Turmeric—The powdered root of circuma longa.

At the New York and Brooklyn mills I found: Venetian red,

yellow ochre, quina, indigo and indigo extract (the latter a sulphate of indigo or indigo carmine), Persian berries with ochre, giving a grayish green colored pigment.

Of these colors I would select two, the use of which, in my opinion, should be prohibited at once, namely, chrome orange and celestial blue.

The remaining colors, while not so injurious as these, are used to deceive the public, and should be regarded as an adulteration. Coffee which has become spoiled or discolored from sea water, or in any way rendered unsaleable, is sent to these mills by their own statement, and made to appear like a good article; green and unripe coffee is thus rushed into the market and given a brown color of age. As the object to be obtained by the use of these colors is to deceive the public, it should be looked upon as an illegitimate business.

I have examined these coloring matters for arsenic, copper, lead and antimony, and have found only the chromate of lead, as above stated.

On examination of the coffee itself, the lead was found to adhere in considerable quantities to the beans. The examination of twenty samples of polished coffees from the market shows that the use of lead and Prussian blue are very common. In treating a portion of the coffee with dilute hydrochloric acid filtering, passing sulphurated hydrogen through the solution to remove the lead, and adding nitric acid, I was surprised to find large quantities of cyanogen gas to be given off with rapid appearances.

As Prussian blue is insoluble in dilute hydrochloric acid, it would seem to indicate that there is either a soluble cyanide used in some of these coffees, or that the blue mentioned undergoes decomposition in the presence of the hydrochloric acid. I hope to be able to further examine into this question.

Respectfully, E. H. BARTLEY, M.D., Chemist.

W. W. Goodrich, Esq., appeared as counsel for the two firms, and Mr. J. A. Green, of the firm of Bartlett & Green, of the New York and Brooklyn Company, was also present. Professor Morton, the well-known chemist, attended in the interest of the manufacturers. Superintendent Thompson, of both mills, materially aided in the course of the examination.

Mr. Goodrich stated that the two firms which he represented intended to keep to the agreement that they had made at a previous hearing on the subject, to discontinue using any coloring matter that the Health Department would decide deleterious. Professor Morton would explain the quality of the coloring materials used and show that they were not injurious to health.

Professor Morton then took the witness chair, and without being sworn, gave an informal statement of the kind of drugs used in coloring coffee. He thought that the use of chrome yellow and Prussian blue should be prohibited, as it was dangerous to health in any way, especially in preparing coffee for consumption. It was certainly harmful to health, to state the matter mildly, and he was not in favor of the use of any thing in the preparation of coffee or any other article used by the public which could have in it even the suspicion of doing harm. Professor Morton then explained the characteristics of the various drugs which were described in Dr. Bartley's report of his analysis, and was of the opinion that turmeric was not hurtful, as it was used very largely in the preparation of curries, which were eaten generally, and he had never heard of any harm coming from it. The Professor then described in detail the treatment of the coffee at the New York and Brooklyn mills as seen and investigated by him on Tuesday last. He selected three different grades of coffee, the principal ones which the firm prepared for the market. They were known as the Costa Rica, La Guyra, and Rio. The largest amount of coloring matter was applied to the sample of La Guyra, and he had found to about one ton of coffee was added six ounces of indigo, a pint of turmeric suspended in hot water, and dry color, consisting of three-eighths of an ounce of dry indigo, half an ounce of drop black, five ounces of soapstone, and ten ounces of yellow ochre. In this mixture there was about 4–10000ths of a grain of indigo coloring to one ounce of coffee. He would not deny but what this might be deleterious to health if the coffee was drank in sufficient quantities to have the ochre work on the system. Professor Morton, in answer to Commissioner Raymond and Mr. Goodrich's questions, went largely into details and technical phrases in explanation of his theory. The samples of coffee in which arsenic was discovered by Dr. Bartley, were not, in his opinion, found in the samples received from the Brooklyn mills.

Commissioner Raymond thought this was the case and coincided with the Professor in his opinion. It was generally agreed that the coffee containing the arsenic had been brought from Holland, where the arsenical coloring is largely carried on, and the coffee dealers in this country were blamed for the

deception. It was admitted that the coloring process was used simply to enhance the market value of the coffee before roasting.

At the conclusion of the hearing Commissioner Raymond decided that Dr. Bartley's report was correct, and adopted it in full. This will prevent the coffee dealer from using the drugs stated by the chemist in his report to be deleterious to health.

How far this conclusion—that this action "will prevent the coffee dealer from using the drugs stated by the chemist in his report to be deleterious to health"—depends more, doubtless, on the watchfulness of the health authorities than on the promises of the persons detected in this instance. It is surely no stretch of just suspicion that persons who have been detected deliberately engaged in a practice so infamous as this, will regard their promises only so far as they may be able to cover their tracks. It is the height of nonsense to suppose that these men did not know the nature of the substances they used in this nefarious traffic. And by engaging in it they have abundantly proven that they are equal to any degree of villainy, for the sake of filthy lucre. Their chief study in the future will be, not how to avoid the use of means destructive of health and life, but how to avoid detection.

Investigations of this character, without the power to commit persons detected in practices dangerous to health and life, will have effect only so far as persons who may be made familiar with the names of the perpetrators, and "boycot" them to that extent. As unprincipled characters, they are comparable with dynamiters—ay, worse—for these have a sentiment at stake which they would maintain; but he who would, in his greed for gain, poison the food of those from whom he would reap his harvest, is of all men surely the most despicable and dangerous.

DIDN'T CATCH HIS MEANING.—The New York *Sun* says that a Chinaman came into the ladies' cabin of a Brooklyn ferry boat the other day and took a seat beside an Irish market woman. He seemed to want to make himself agreeable, and remarked: "Belly cold." The woman looked at him with an air of contempt, and replied: "If you'd put your shirt in your pants your belly wouldn't be cold, you haythen blackguard."

HILLSDALE SANITARY CONVENTION.

SANITARY WANTS OF HILLSDALE—PURE WATER AND SEWERAGE; SANITARY CONDITION OF SCHOOL-HOUSES; ALCOHOL AND TOBACCO; VENTILATION; RESTRICTION OF INFECTIOUS DISEASES; HEALTHY HOUSEHOLD MANAGEMENT; PERNICIOUS FOOD, ETC.

We are under obligations to Dr. H. B. Baker, Secretary of the State Board of Health of Michigan, for the following abstract of the proceedings of the convention held at Hillsdale, Mich., under the auspices of the State Board, April 17–18, 1884:

The meeting was opened with prayer by the Rev. T. S. Allen, after which the visitors were welcomed to Hillsdale by Mayor Holloway, in behalf of the city, in a few appropriate remarks.

A letter from Hon. C. M. Croswell, regretting that he was unable to attend the convention, was read by the Secretary.

Hon. John M. Avery, President of the State Board, not being present, the introductory remarks were made by Henry B. Baker, of Lansing, who explained the origin of these conventions, their nature and object. Their purpose is the association of many minds learned in sanitary matters, that all may contribute their quota to the public intelligence. His remarks were supplemented by J. H. Kellogg, of Battle Creek.

The opening address, by Hon. E. L. Koon, was a concise review of the reasons and necessities of bringing sanitary topics before the people. In some particulars the laws endeavor to restrain the production of unhealthy conditions, but the wholesale violation of the commonest laws of health can only be checked by educating the public mind. The sanitary wants of Hillsdale were unsparingly portrayed by its former Mayor.

Prof. Sally had consented to fill Rev. S. W. Sample's position, who was kept away by sickness, and followed the President in an interesting talk on the relation of health to morality and religion. The gist of his argument was, that it is not the nature of man to violate one branch of law and respect another; hence, one who neglects all physical laws cannot be

expected to respect the divine law. His remarks were followed by an animated discussion.

A variation of the programme next brought Rev. D. H. Lamson before the audience, who read a paper on the sanitary condition of school-houses. Mr. Lamson occupied his time in giving numerous instances of the lamentable condition in which district school-houses are often found, drawing largely from his own experience; and in suggesting soundly practical remedies for the deficiencies.

After a brief discussion of this subject, the convention adjourned till evening.

The second session was better attended than the first—the church being entirely filled. The opening exercise was a paper by W. C. Gage, of Battle Creek, on the subject: How best to fulfill the conditions of the new law respecting the effects of alcohol and other narcotics. The difficulties surrounding this new attempt to overcome the great enemy of mankind were ably pointed out. We have no experience to draw upon for guidance, only the crudest of text-books, and with these the teachers are not as yet familiar. In some respects the law seems in advance of public sentiment. How can we teach the evil of so common a practice as tobacco using? Is it consistent to pay the teacher of the evils of alcohol with the money raised by licensing the saloon keeper? Such were some of the points pertinently presented, which called out so many speakers that Dr. Kellogg, of Battle Creek, was compelled to hurry through with his discourse on the proper use of air or ventilation.

He was successful, however, in interesting the large audience for a considerable time. With the aid of a blackboard he gave a lucid description of the formation and functions of the human lungs. Then followed computation of the amount of air required by an individual, and, lastly, by some ingeniously contrived apparatus, he gave actual demonstration of the only true methods of successful ventilation. On his concluding—it being too late for further proceedings—the convention adjourned.

The Friday morning session had been fixed at half-past nine, and a good audience assembled, considering the time of day.

The first paper was on the co-operation of citizens and health authorities in preventing and restricting disease.

This subject had been assigned to John K. Allen, of Chicago, but as he was unable to be present, Prof. Geo. A. Hendricks, of Ann Arbor, had consented to read his paper for him. His paper was an earnest effort to convince his hearers that the health officer should be treated as a friend, and his instructions implicitly obeyed, though personal comfort and convenience should be sometimes sacrificed to the public welfare.

Mr. Allen gave many valuable hints in regard to the healthy construction and management of households.

After a few remarks on this general topic by several gentlemen, the attention of the convention was taken by Hon. W. J. Baxter, who read a paper on the sanitary condition of the jails of Michigan. The gentleman's experience as Secretary of the State Board of Public Charities enabled him to handle this subject in an interesting manner, which, however, excited an animated discussion as to the treatment deserved by criminals.

The morning session was closed by an able paper on Pernicious Food, by Dr. A. R. Smart, of Hudson, whose enumeration of foods that should be carefully inspected leaves us very little to eat with assurance.

In the afternoon, for the first time, the session was conducted according to the programme.

C. H. Harris, of Jackson, read a paper on Sanitary Drainage, and, for illustration, had a series of sketches covering one wall of the church, representing the faults of bad drainage, its injurious effects, and the remedies prescribed by sanitarians. Mr. Harris is President of the Michigan Brick and Tile Association, and his remarks on this much debated question of drainage showed him to be a complete master of the subject.

He was followed by Prof. Henry F. Lyster, President of the Michigan College of Medicine, who presented a subject similar to the last, namely, Sewerage. The absolute necessity of the removal of waste matter and the slow but certain effects which neglect of this necessity has upon any community, were clearly pointed out, and supported by instances ancient and modern.

By comparing the condition of Hillsdale with these examples, it was demonstrated beyond question that money spent in improving our condition in this regard would be an economical investment. It were short-sighted wisdom to wait for some scourge to start us into activity.

A somewhat lengthy discussion succeeded Prof. Lyster's paper, during which the committee appointed to examine the jail reported that in general its condition was good, but its system of ventilation was considered by the committee as useless. The report was accepted by the convention, which then adjourned to meet at 7.30 P. M.

The fifth and last session was given up entirely to the consideration of Hillsdale's water supply, and the immense audience that packed the church showed plainly that the citizens appreciated the importance of the subject.

Previous to the regular exercises, resolutions were heartily adopted by the convention, thanking the visiting gentlemen who had taken part in the proceedings; City Physician, Bion J. Whelan, for his labors in managing the occasion; the M. E. Society for the use of their church, and the L. S. & M. S. R. R., for giving reduced rates to the convention.

The first paper, on the Water Supply of Hillsdale, was by L. A. Goodrich, a skilled chemist, giving the result of an exhaustive analysis of numerous samples of the water used in the city. His conclusions were, that the water is not as bad as it might be expected to be, considering its surroundings, but that it is within the power of the authorities to procure a much purer quality, free from contamination.

Mr. Goodrich was followed by Dr. A. F. Whelan, who treated the same subject in a more general manner, giving interesting data as to the geological formation of the soil of Hillsdale and its relation to the sources of drinking water. It was his judgment, founded on his long experience as a practitioner in this city, that the condition and quality of the water was a frequent cause of disease, and should no longer be neglected when a better water was so easily at hand.

On the conclusion of Dr. Whelan's paper, the convention was permanently adjourned by the President.

It is a matter of no small credit to the citizens of Hillsdale that members of the Board of Health pronounce this the best attended convention of this nature ever held in the State.

EDUCATION ABROAD.*

EUROPE.

Austria-Hungary.—There are elementary, secondary, superior and higher technical institutions, and institutions for special instruction. The elementary institutions consist of at least one burgher school in each school district, and a common school wherever, without it, there would be 40 children of school age within the extent of a league, who would be more than two and a half miles from school. Secondary schools include Gymnasien and Realschulen. The whole number of elementary schools is 16,390. Five languages were chiefly used in the different schools; and many of the schools had gymnasiums, or gardens and nurseries. The teachers were 27,597 males and 6,288 females, besides assistants. Their classification as to age and religious faiths is specified. Of 2,744,180 children of school age, 2,377,624 attended school at the close of the year.

The number of secondary schools was 242; normal training schools for elementary schools, 65; for secondary schools, 68; and institutions for superior education, 68, comprising 7 universities, 6 institutions for superior technical education, 1 agricultural academy, 2 mining academies, 6 mercantile academies, 2 art academies, and 44 theological seminaries. Special instruction was given by 52 mercantile schools, 295 technical industrial schools, 160 singing and music schools, 64 schools of agriculture and forestry and their branches, 6 mining schools, 4 veterinary schools, 14 schools of midwifery, 5 naval schools, 261 schools for instruction in female work, and 339 unspecified.

Hungary has a similar classification of schools, and an excellent outline of them is given. They are, as far as management is concerned, either purely governmental, communal, catholic, connected with self-governing religious denominations, or private. All are more or less under government supervision, except the higher schools of certain religious denominations. Two ministerial decrees of 1880 are mentioned—one

* Abstract of Report of U. S. Commissioner of Education, 1881. The counterpart of "Education in the United States." Vol. XII. p. 250.

insisting upon sanitary precautions in keeping the school buildings, rooms and outhouses clean, and in regulating the conduct of pupils to the same effect; the other having reference to giving the pupils of the common schools in districts where the mulberry tree flourishes practical instruction in silk culture. The appropriation for common schools was $676,523 in 1880. The number of children of school age (6–15 years) attending school was 1,619,692, or 77.22 per cent of the whole.

Belgium.—The number of persons in training for teaching primary schools, and in actual service, with the number of scholars, is 687,749—12.5 per cent. of the population. The attendance on the 4 universities of Belgium is 4,568; on its 4 veterinary, agricultural and horticultural schools, 222; on 32 technical industrial schools, 9,208; and on 58 apprentice workshops, 1,457. In 1880, out of 49,054 persons who were drawn for service in the militia, 8,478 could neither read nor write, 2,022 could read, 22,029 could read and write, and the remainder of whom record was made possessed a higher degree of education.

France.—A law was passed on June 16, 1881, making instruction absolutely free in the public primary schools, including certain communal schools for girls, maternal schools and infant classes. There were 74,441 primary schools, 122,760 primary teachers, and 5,049,363 scholars. School and pedagogical libraries and school savings banks are numerous. A law of December, 21, 1880, provided for the establishment of institutions for the secondary education of girls, to be founded by the State, with the concurrence of the departments and communes. These institutions are to be day schools, although boarding schools may be annexed to them at the request of the municipal councils, with the consent of the government. The course of instruction is to comprise morals, the French language, reading aloud, and at least one modern language, ancient and modern literature, geography and cosmography, French history, and a review of general history, arithmetic, the elements of geometry, of chemistry and physics, and of natural history, hygiene, domestic economy, needlework, elements of law, drawing, music, gymnastics. Proceedings toward the opening of these schools have been taken, and provision for the training of teachers for them has been decreed.

Germany.—The percentage of illiterates in the recruits of the German army and navy is steadily declining. Prussia had 2.33 per cent. in 1880–'81; Bavaria, 0.29 per cent.; Saxony, 0.17 per cent.; Würtemberg, 0.02 per cent.; the rest of the empire, 0.49 per cent. For the whole empire the figures are 2.37 per cent. in 1875–'76, against 1.59 per cent. in 1880–'81.

An account of public schools in Germany by an American consul is presented. He says that the whole educational system of the several States of Germany is placed under the chief supervision of the ministers of ecclesiastical affairs and public instruction. Salaries are paid from the municipal treasuries, and pensions are granted in cases of death or disability. The elementary schools in large cities and towns, as a rule, consist of eight classes, and children have to attend them from their sixth to their fourteenth year. The regular course of study in these schools comprises the following subjects: Religion, reading, writing, common rules of arithmetic, and the rudiments of algebra, the elements of geometry, history (chiefly Prussian and German), drawing, geography (chiefly extending over Prussian and German territory), the elements of physics and natural history, German composition and grammar, and compulsory gymnastics (Turnen). In addition, the girls are taught sewing and knitting. Though education is compulsory, moderate tuition fees are required. They are only a small contribution to school expenses, but the rate is fixed high enough in the secondary schools to practically exclude the children of the poor classes. In fact, there are no schools where the children of all alike receive common instruction. Public schools are increasing, but not so rapidly as to keep pace with the increase of population. The erection of buildings is a continual expense. The number of teachers' positions has increased 2,324 in Prussia in two years. The children subject to attendance in Prussian elementary schools number 5,503,970—over 20 per cent. of the population. The tax levy for school purposes is 35 to 45 per cent. of the general tax levy in many districts.

Great Britain and Ireland.—England and Wales have about 5,268,000 children between 3 and 13 years of age for whom elementary education should be provided; accommodations for 4,389,633 scholars; an enrollment of 4,045,362, and an average daily attendance of 2,863,535. There is a gradual improve-

ment shown in the results of examinations, attributable to more regular attendance and increased proficiency of children and to the greater attention paid by teachers to individual progress. Military exercises and cookery are taught, and savings banks and school libraries are increasing. About 70 per cent. of the male teachers and 50 per cent. of the female have attended a training college. An average master's salary is about 121*l.*; that of a mistress 72*l.* 10*s.* Residences are furnished to nearly one-half the masters and one-third the mistresses. The proportion of female teachers is increasing.

London has 685,240 children between 3 and 13 and provides school privileges for 502,095. The average gross annual cost per child on the average attendance is 2*l.* 17*s.*; average salaries of men 144*l.*; of women 108*l.* Classes for the blind were maintained in 30 schools. Numerous industrial schools have been established, and the amount of juvenile crime is being steadily reduced.

Scotland has school accommodations for 612,483 scholars; 544,982 enrolled, and 409,966 in average daily attendance. The education of the poorer classes is promoted by aid from parochial authorities. About 72 per cent. of the male and 76 per cent. of the female teachers have attended a training college. Many others have received thorough preparation as assistants. The average salary of a master is 137*l.*; of a mistress 69*l.*; in many cases with residences free of rent. The school statistics of Scotland show great advances from 1872 to 1881.

Ireland has an enrollment of 1,066,259 in primary schools on the operation list, and an average attendance of 453,567. The attendance upon schools under denominational teachers was larger. The chartering of the new Royal University must be regarded as marking an era in the history of education in Ireland. It is empowered to confer all such degrees as can be conferred by any other university in the United Kingdom, degrees or other distinctions in theology excepted. No residence in any college nor attendance at lectures in the university is obligatory except for degrees in medicine and surgery. By these provisions the education of the Roman Catholic youth of Ireland is relieved of invidious distinctions.

An account of prominent phases of special instruction in-

cludes a sketch of the Normal School of Science and Royal School of Mines, and mentions items about the City and Guilds of London Institute, and the training of teachers.

Greece requires the attendance at school of all children between 5 and 12 years old. Four classes of schools exist: communal, ancient Greek, gymnasia, and universities. Illiteracy claims 55 per cent. of the male population and 75 per cent. of the female. The annual expenditure for primary education is $443,900. The average teacher's salary is $100.

Italy is proposing another compulsory school law.

In the *Netherlands* are 2,791 public and 1,136 private elementary schools. The public schools are attended by 226,766 boys and 182,574 girls; the private schools by 62,857 boys and 79,735 girls. Evening schools are attended by 22,212 boys and 12,029 girls, who also attend day schools, and by 8,610 boys and 2,256 girls who attend no other schools. Normal instruction is given by seven State normal schools, by normal courses in the provinces, and by seminaries at Leyden and Amsterdam. The normal courses have been systematized, and their studies include the Dutch language, reading and writing, history, geography, arithmetic, geometry, natural history, singing, pedagogy, drawing, mathematics, gymnastics, French, and female handiwork. Secondary instruction is given in several classes of schools. Superior education is to be had in the three famous universities of Holland (Leyden, Utrecht, and Groningen), which were aided by the government to the extent of over half a million dollars in 1881. Special instruction is afforded by agricultural, horticultural, veterinary, polytechnic, naval, military, East Indian, and other schools.

Norway has not furnished recent statistics. Education there is obligatory. Each parish has a schoolmaster, and almost every town supports a superior school. Seventeen principal towns have colleges, and the university at Christiania is attended by about 900 students annually.

Portugal has an unenforced compulsory school law. A little progress in primary education is reported. There are lyceums for secondary education, a polytechnic academy at Oporto, and a university at Coimbra.

Russia.—The mass of the population of Russia is as yet without education; in fact, elementary education is almost im-

possible according to the present system of instruction. The greatest dearth of schools is in those provinces which have a purely Russian population. In a male population of 40,000,000 there is one pupil to 45 persons, while the ratio among the women is one to 222. The peasant children can only obtain elementary instruction in schools which have been established in strict conformity with all legal requirements, which are supported from certain specified funds, and whose teachers have received their appointments in accordance with certain specified forms; and there are few such schools. The universities of Moscow and Kief have nearly 3,500 students.

Spain has advanced educationally during the last few decades. The attendance upon primary schools increased 117 per cent. from 1850 to 1865, and 36 per cent from 1865 to 1880. Universities are numerous and well attended.

Sweden has one well established school for each parish, instructed by a normal graduate. Ambulatory schools are found in thinly populated sections. The public schools have a division for children from 8 to 10 years old, and another for more advanced pupils. The institutions for secondary instruction are classified much as in Germany. The universities at Upsala and Lund are well endowed and take high rank.

In *Switzerland* education is widely diffused. In the Protestant cantons the proportion of school-attending children is to the whole population as one to five; in the half Protestant and half Roman Catholic cantons it is as one to seven; in the Roman Catholic, one to nine. Instruction is obligatory from the age of 6 to 12. Primary and secondary schools are found in every district; in the former the elements of education, with geography and history, are taught; in the latter (for children from 12 to 15 years of age), modern languages, geometry, natural history, the fine arts, and music. Normal schools, for training schoolmasters, are in all the cantons, and there are four universities. Statistics relative to cantons are given, by which these statements are supplemented.

Turkey.—There 450 burgher schools in Constantinople and the provinces, attended by more than 5,000 scholars. Bulgaria has 1,365 primary schools. More than 400 school-houses have been built since the Russian occupation; but the securing of teachers is not so easily accomplished. Most of them are

hastily prepared. The Mussulman and Israelite schools are kept up. There is as yet no superior education. In Roumelia education is obligatory, and the statute further declares that after 15 years the right to vote shall extend only to those who can read and write Bulgarian, Greek, or Turkish. There are no normal or superior schools; young teachers study pedagogics during their vacations.

ASIA.

India.—The systems of education in India resemble that of Great Britain. The expenditures are met by grants, local taxes, tuition fees, subscriptions, endowments, etc. The institutions are classified with respect to grade into universities, colleges, secondary schools, primary schools, and schools for special or technical training; with respect to their relation to the government, into government schools, aided private schools, and unaided private schools under government inspection. There are further classifications, according to sex, language used, and religious faith. There are universities at Calcutta, Madras, and Bombay. A fourth is proposed. A school for girls has been added to the colleges of Calcutta University. In nine provinces, having a population of 201,064,016, there were in March, 1881, 5,620 scholars in colleges of the arts; 1,497 in colleges for professional training; 19,847 in schools for special or technical training; and 275,340 in secondary schools. The elementary aided schools and unaided schools under government inspection had, at the same time, an enrollment of 1,888,345, of whom only 103,357 were girls. Primary instruction is aided by only a small proportion of the total expenditure for education. There is a growing interest in education in rural districts and among the Mahometan population.

Japan has many thousand schools arranged after European models, and private persons have contributed at least $30,000,000 for school purposes. The Japanese minister of education is (1881) studying education in Germany with a view of introducing some changes in the home system.

NORTH AMERICA.

Dominion of Canada.—The seven provinces of Canada regulate their own educational affairs, but not so as to interfere with the central administration. A council of education and

one or more superintendents have charge of public instruction in most of the provinces. The provincial reports contain much interesting information.

British Columbia, with 50,000 inhabitants, has expended $480,395 for education, and furnished instruction to more than 6,000 children during the last ten years.

The annual expenditure for schools in New Brunswick is about $500,000. Teachers' salaries are from $186 to $508. The school year contains 108 teaching days in summer and 117 in winter. Over 1,300 schools are reported and 62,623 scholars.

Ontario has a school population (age 5 to 16) of 489,924, nearly all of which is in school. The average daily attendance at the public schools is 220,068. The total expenditure for all public school purposes is $2,822,052—an average of $5.85 for each pupil. An account of the public school system, by Philip Carroll, Esq., a United States commercial agent in Canada, gives the officers of education, the methods by which schools are supported, the territorial divisions for educational purposes, the classification of schools, the preliminary requirements in establishing Catholic or colored schools, the qualifications of teachers, the length of school terms, and many other items of importance.

Quebec has 4,800 schools of all classes, with 6,906 teachers and 238,126 pupils, an average attendance of 180,370, and a tax levied of $1,997,135. Three normal schools were attended by 314 students. The polytechnic school at Montreal is noticed at some length.

SOUTH AMERICA.

The *Argentine Confederation* has 1,505 schools receiving aid from the government, and attended by 112,400 pupils. A lack of competent professors is reported, and financial embarrassments are a hindrance. Thirteen normal schools exist, and more are contemplated. College attendance is not what it should be. An educational commission is trying to place primary instruction on a more solid basis. Better financial management and supervision have been obtained already. Many schools have recently been enlarged and newly equipped.

In *Brazil* public education is divided into three distinct forms: Primary, secondary or preparatory, and scientific or superior. Since the termination of the war with Paraguay a gen-

eral awakening on the part of the State authorities, private institutions, etc., as to the needs of Brazil in regard to education, has been perceptible. No effort has been spared within the last dozen years to develop public instruction, and large expenditures have been made towards that end. Many new school-houses have been erected, and the latest furnishings and apparatus added; new schools established; collections for object teaching organized; translations into Portuguese made of the best text-books used in the schools of France, Germany, and the United States; the teachers do better work; the attendance of pupils has been looked after; and the schools generally rank higher.

Public education in *Chili* is divided into primary, secondary, and superior. The free public schools in 1880–'81 numbered 638. The number of children enrolled was 48,794; average attendance, 34,089. The total number of public and private schools was 1,043. There are 4 normal schools. In 1881 the State appropriated $1,119,620 for school purposes. The higher and intermediate or secondary schools are free, and have their own buildings, apparatus, etc. The principal one, in Santiago, is called the National Institute. The 17 high schools in the provinces have 2,176 students. They give instruction in Latin, French, English, general history, and history of Chili and America, philosophy, literature and history of literature, physical geography, physics and chemistry, mathematics, drawing, natural history and book-keeping. In the schools in the mining districts the application of physics and chemistry to mining and metallurgy is taught, and in commercial centres suitable instruction is given to prepare students for active life. There is also an agricultural school, a technical school, and a school of fine arts.

The *United States of Colombia* have primary, secondary and superior instruction under the direction of a Secretary of State. Each separate State has a director of public instruction and departmental superintendents. The course of study in the 1,500 primary schools comprises reading, writing, arithmetic, national and universal geography, history, agriculture, botany, zoology, French, English, German, Spanish, and military exercises. A national university, military school, and schools of architecture, painting and music are at Bogota; there is a school of mines at Antioquia, and a naval school at Carthagena.

AUSTRALASIA.

The statistics of day schools, night schools, and training colleges in *South Australia* are given. The cost of public instruction and school buildings for 1881 was about 123,000*l.* The average cost of instruction for each child in average attendance was about 3*l.* The number of acres of land dedicated to educational purposes is 241,538. The regularity of attendance is improving under the operation of a compulsory law.

New South Wales has the prosperous Sydney University, with three affiliated colleges. The secondary institutions include several of high character, among which are the Workingmen's College, and the Sydney Grammar School.

THE GREAT WALKING MATCH AND THE WALKERS.

The Brooklyn *Eagle* gives the following characteristic description of the contestants in the great walking match at the end of the *five days, twenty hours and thirty-five minutes*, at the Madison Square Garden, New York, May 3, 1884. The distance made was, by Fitzgerald, 610 miles; Rowell, 602 miles.

The people at the walking match actually seemed to gloat over the poor wretches who toiled around the track. The horrors in the crypt at the Eden Musee were as nothing compared with the faces of the so-called racers in the six days' walk. They have in the Chamber of Horrors in this museum various wax faces illustrating more or less agony. One is the face of a Moor whose head has just been chopped off by an executioner. Another is the face of a man who is being scalped. Another is the face and head of a victim who is being roasted alive by cannibals. All of these faces are sufficiently horrible, but they are not a marker to the faces of six day pedestrians, after they have been on the track for three days. Fitzgerald's face—unshaven, uncouth, distorted and ungainly, withered by the tremendous strain and lined like a cobweb—was a more repulsive sight during the last three days of the match than anything in the Eden Musee. His eyes were sluggish, bloodshot and heavy, and encompassed by huge purple circles. His cheeks had so sunk in that the contour of the teeth could almost have been seen through them, and every movement was an illustration of acute agony. He swung his arms painfully,

his head dropped on his chest, his shoulder-blades stuck out sharply from his attenuated body, his legs dragged lamely one after the other, and the muscles of his neck twitched nervously with every step. He dragged himself steadfastly ahead, never turning his eyes to the right or left until he came to the scorer's stand, when he painfully and laboriously turned his face toward the figures to see that they were correctly given. The change in Charlie Rowell is even more pronounced, and if possible, a bit more pitiable. At the start he was as handsome, chunky, well fed and athletic specimen of a man as one could desire to see. He was trained down perfectly. His eyes were bright, his color good and his muscles superbly developed. He moved gracefully and quickly, and looked like a winner from the start. As the race progressed the color faded from his cheeks, his eyes grew heavy and his brow wrinkled until it seemed shriveled. His shoulders drooped and his cheeks fell away until he was almost unrecognizable. The terrible strain drew his face almost out of proportion and made it repulsive to look upon. These were the two leaders. They were in better condition than any other men in the race. Night after night and day after day thousands of people poured into the garden and hung for hours over the rail staring at the faces of the poor wretches who were dragging themselves around the track. There seemed to be a sort of morbid fascination in it for the crowd. A man would get a position along the rail where he could see the walkers for an instant as they passed on their rounds. Here he would stand for five or six hours in the stifling atmosphere, pushed and jostled by the crowd, just for the chance of catching a glimpse of the faces of the toiling wretches as they came around the track. Every one who came in exclaimed at the revolting appearance of the men and then crowded eagerly for a place where they could catch a closer view of them. All this has been written many times before, but one cannot visit the six days' walking horror without being duly impressed by it. What is there in the nature of sport in a six days' walking match? One can understand the admiration the people feel for a well-contested and swift running or boat race, a good game of base ball, a scientific sparring match or a rattling game of tennis, racquets, lacrosse, foot-ball or cricket. In all of these a man needs endurance, pluck and science. No one is injured, constitutions are not wrecked, and the contestants do not pass through a period of prolonged and horrible suffering, as they do in one of the lengthy contests of the Madison Square Garden.

PNEUMONIA—AN INFECTIOUS DISEASE.

We extract from the *Medical Record's* report of the proceedings of the Third German Congress for Internal Medicine, held at Berlin, April 21–23, 1884, the following paper, by Professor JURGENSEN, of Tubingen, on *True Pneumonia: Its Etiology, Pathology, Clinical Course and Therapy.**

The author gave a history of the growth of our knowledge of croupous pneumonia, and showed how opinions as to its nature had changed, until now the belief exists that pneumonia is a general infectious disease, the lung inflammation being only symptomatic. Experimental pathology had recently given indirect confirmation of this view.

The speaker then took up the alleged exciting causes of the disease, and showed that the facts regarding these did not conflict with the infection theory. Cold has been alleged to be a cause. At one time it was even said: "Frigus unica pneumoniæ causa." Different authorities reported cold to be a cause in between two per cent. and twenty per cent. of the cases. Jürgensen had in ten years' observation found cold as a cause apparently in ten per cent., really in only 4.1 per cent. It might easily be thought that exposure will produce a catarrh rendering easy the access of the infectious organisms of pneumonia.

It is a prevalent error, says Jürgensen, that pneumonia attacks by preference the strong and full-blooded. Among a population of all ages, three-fifths of the pneumonias occur in those between one and fourteen years, while twice as many occur after forty-five as between twenty and forty-four. Dittel found that the disease occurred in those previously weakened, in eighteen per cent. of cases; Flint, of Dänemark, in twenty-

* Many of our readers will be reminded by this paper, of a paper on the *Relations of Certain Filth Diseases to Cold Weather*, read before the American Public Health Association, in New Orleans, 1880, by A. N. Bell, with special reference to the zymotic origin of pneumonia. It is published in full in Reports and Papers of the A. P. H. Association, Vol. VI.; and in THE SANITARIAN, Vol. IX., p. 78.—Editor.

one per cent.; the author, in 29.3 per cent. Immermann, of Basel, recently confirmed this view. The disease has some relation to the meteorological conditions, being increased when there is increased humidity of the soil (Keller) and when the atmospheric precipitates are above the mean. These facts might be explained by the theory of an organic poison.

Pneumonia is *a disease of dwelling-houses*, like typhoid. Jürgensen had seen pneumonia in a dwelling in Amberg. Sometime later the pneumonia cocci were found in the walls of the chamber. The disease occurred in epidemics, especially affecting single houses, or prisons, asylums, etc. The possibility of direct passage of the disease from one person to another cannot be denied, but the occurrence is rare. Flint, of Dänemark, found some relation between earlier and later cases in two-thirds of his patients.

The question of the unity or multiplicity of the pneumonia poison would soon be settled.

Clinically, the disease presents great diversity even in the same families and sick-rooms. This the author was inclined to explain by assuming a variation in the extent of the development of the infectious poison. He believed that this poison, circulating in the blood, affected with special inflammation or disturbance other organs than the lungs. He cited thirteen cases of pneumonia with acute nephritis in which the kidneys were found to contain the special cocci. He believed that these produced special disturbances of brain membranes or stomach or other organs. Their development gave rise to the irregular curve of pneumonia.

Clinically, the disease may be separated into three great groups, first, those in which the general symptoms of infection, second, those in which heart symptoms, and third, those in which the lung symptoms are prominent.

In reference to prevention, the discovery of the coccus and the knowledge that it is a house-plant is of importance.

As to treatment, the author had tried iodine as an abortant without effect. The author gave a

Caution as to antipyretics, considering them heart-depressants. He pleaded for prophylactic therapy, was doubtful of the ultimate value of bleeding, though it might temporarily relieve the heart. Finally, he announced the following con-

clusions: first, true pneumonia is an infectious disease, usually but not uniformly localized in the lungs; second, exposure to cold is a rare cause. The feeble are more susceptible to it than the strong.

HERR FRANKEL, of Berlin, continued the discussion, and took up the subject of the

Micrococcus of Pneumonia.—This coccus is distinguished from others by its gelatinous-like capsule, which may surround two or more cocci. The capsules are not always present. The cocci are stained by a mixture of gentian-violet in water. Injected into rabbits they produce no uniform effect, in mice they cause pneumonia and pleurisy. In dogs, pneumonia is sometimes produced. The author found that variations in inoculation effects depended somewhat upon the cultures, which apparently had an effect of diminishing the virulence of the virus. There was also another encapsuled coccus found in the human mouth, and which was the coccus of sputum-septicæmia. The author announced the following theses:

1. The coccus of pneumonia, which may be isolated by pure cultures from the human being, is inoculable in various animals. Rabbits either prove refractory or become affected with severe general disease, with special localization of the virus in the internal organs—this depending on the mode of culture.

2. Further experiments must determine upon what depends the varying virulence of the coccus.

3. The capsules of the cocci, as well as the "Nagelfôrmige" growth of the pneumonia cultures, are not constant phenomena.

4. The capsules and the "nagelcultur" characterize other micro-organisms, and it cannot be said at present that the pneumonia cocci can be distinguished from them.

HERR FRIEDLANDER, of Berlin, said that the cocci of pneumonia were found in the blood during the disease. He had recently obtained the blood by wet-cups in six cases of croupous pneumonia, every precaution being taken to keep it pure. The blood thus obtained was cultivated for cocci. In one out of the five cases these developed and showed their characteristic actions when inoculated. Friedlander thought the capsule and the growth in "nagelform" very characteristic, but not sufficient for a positive diagnosis. The whole life-history must be taken into account. This life-history appears to differ,

and this may account for the various forms of pneumonia, and only one has the coccus; or in the different forms the same coccus has a different life-history. The chief efforts must now be made to follow out the different changes in the growth of the organism.

DR. GERHARDT, of Würzburg, accepted Jurgensen's view of the infectiousness of the disease. He accepted also completely the view of the unity of the disease, and considered it a happy explanation that the various complications of meningitis, pleuritis, etc., were due to local manifestations of the virus. As to treatment, it must be expectant and symptomatic; in the anæmic and feeble, a stimulating treatment. As anti-febrile means he thought veratrine dangerous; digitalis had not achieved as much as expected; kairin acted too irregularly. The most regularly acting substance was nitre (nitrum); in severer cases, quinine; in the worst (febrile) cases, cold baths with stimulants.

DR. FRANTZEL, of Berlin, argued against Jürgensen's view that pneumonia was a house disease, citing its occurrence in military hospitals, and its frequency after open-air festivals and exposures. He thought the coccus entered the blood through the lungs. He explained the hæmadogenous jaundice of pneumonia by the theory that the cocci attack the red blood-cells.

DR. RUHILE, of Bonn, contended that the view of the infectious nature of pneumonia was not so firmly established as its advocates assumed. It is necessary still to harmonize some of the known facts as to the etiology of pneumonia with the theory of a coccus. Besides, this coccus had not been found in all cases yet.

PROFESSOR NOTHNAGEL said that, in pneumonia, as in all infectious diseases, we look for a specific, and meanwhile treat symptomatically. In the last twenty-five years alcohol had entered largely into the therapeutics of the disease. Dr. Nothnagel thought that it was often used unnecessarily and excessively. Alcohol is not indicated in ordinary cases of pneumonia, and should not be used except when specially indicated by the failure of heart power.

DR. ROSENSTEIN, of Leyden, thought that "though croupous pneumonia may be an infectious disease in many cases, it is not in all." He did not believe in the unity of the disease.

DR. BAUMLER, of Freiburg, said that a patient, a gardener, fell one day into the fire; next day he was brought to the hospital with croupous pneumonia. What rôle the cocci played in such a case was for the future to discover. If pneumonia is an infectious disease, it might be asked whether it is at first a local infection or a general one. With reference to the localization of the alleged virus in other organs, he recalled cases of pneumonia that started off with an acute nephritis; others with a meningitis. These diseases generally ran a parallel course with the pneumonia.

THE FOUL AIR OF GYMNASIA CLASS ROOMS.

NOTES COMMUNICATED BY THE BUREAU OF EDUCATION RESPECTING THE "EXAMINATION OF THE AIR IN THE ROOMS OF BERLIN GYMNASIEN."

By order of the Minister of Education a series of examinations of the air in the class rooms of several Berlin *gymnasien* was made in the winter of 1882–'83 under the direction of enginneer Rietschel, with the following results. In one institution whose rooms are heated by porcelain stoves and are without special means of ventilation, the temperature was 10° C. at 8 A. M. and the amount of carbonic acid was 10 parts in 10,000, which increased to 82.5 parts towards the close of the session at about 1 P. M. The doors and windows were closed during the recess. The effect of keeping them open during that interval is shown by the result obtained in the Wilhelms gymnasium. That building is heated by hot water. The doors were open during recess. The carbonic acid determinations gave 5 parts in 10,000 at 8 A. M. at 9 A. M. 33 parts, after a recess of 5 minutes 20 parts, at 10 A. M. 35 parts, after 10 minutes recess 15 parts, at 11 A. M. 36 parts, and so on until 1 P. M., when it was 41 parts in 10,000. Much more satisfactory conditions were found in two other *gymnasien* which are heated by hot air and have ventilators. In one of them the proportion of carbonic acid at 12 M. was found to be 17.5 parts, in 10,000 and in the other 12.8 parts. In the buildings first described ventilating contrivances will be introduced which will improve the character of the air in the rooms.

AN AMERICAN EXPERIMENT IN THE UTILIZATION OF SEWAGE.

THE CAPE MAY IMPROVEMENT COMPANY'S ENTERPRISE.

By BENJAMIN LEE, M.D., Ph.D., of Philadelphia.

I took occasion last summer to call the attention of the readers of THE SANITARIAN to what appeared to me a very honest effort to solve the problem of seaside sanitation on the part of the company whose name appears above. I then pointed out that the ordinary expedient of sewerage—that is, carrying off the offending materials through sewers to ponds, rivers, sounds, or to the ocean itself—is not available for the Jersey coast, in consequence of the very slight elevation of the shore above the high-water level, of the inevitable return of matters discharged into the ocean to the beach, and of the necessity for preserving the purity of the water for bathing; and concluded that the only way in which the vast accumulations of refuse material which the thronging summer population of this long, low-lying stretch of sandy beach, from Sandy Hook to Cape May, collects, could be disposed of without detriment to the health of the country, was by making use of it for purposes of fertilization of the soil. Several such attempts have been made in England, as is well known, especially that at Croydon, and with a greater or less measure of success. The only similar effort in this country, beside that which I am about to describe, is that at Pullman, Illinois. The results of the trial of last year at Cape May Point, which I described as consisting in the removal of garbage daily, and of sewage as frequently as occasion required, in tightly-covered receptacles to the company's farm, distant from the hotels about a mile, and there feeding the former to pigs and mixing the latter with dry vegetable material to form compost, were briefly as follows: From a farm of 225 acres, much of which a year before had been undrained marsh and covered with low brush, vegetables enough were raised to supply the three hundred guests of the hotels for the entire season; corn sufficient to feed the live stock—horses,

cows, poultry and pigs—two thousand eight hundred bushels of potatoes, and fifty barrels of sweet potatoes. The present appearance of the truck patches promises even better results for the coming summer. The yield of carrots was 565 bushels to the acre, and it is estimated that fifteen tons of beets and rutabagas will be produced to the acre this year. The supply of milk and cream will be ample—and that without resort to the "river," where the milkmen "gather." The present herd of fouteen choice cows, averaging 150 quarts a day, can be increased, if necessary, as the pasturage is ample and corn abundant—twenty-five acres being planted in corn for their express use. Nearly four hundred spring chickens and fifty turkeys are already picking up the early worms from the furrows, and forty pigs are fattening for market upon the swill. At this rate, therefore, it will not take long for the cost of the transportation of the sewage to be more than made good. During the past winter the method of transportation of the sewage proper has been greatly improved. Instead of discharging into wells behind the hotels, as before, the water-closets, baths and sinks now all empty into a 6-inch cast-iron pipe, which runs a distance of fifteen hundred feet, with a fall of seven feet, to a cemented well, having a capacity of six thousand five hundred gallons. A four inch soil-pipe, extending up fifty feet to the roof of the house, acts as a ventilating shaft, two or three ventilating openings occurring in the course of the sewer-pipe for the admission of air. The traps of the closets are all ventilated into a smaller pipe, which runs up into the chimney-flue—always hot, day and night—thus securing an unfailing upward draught. The closets are of the pattern known as the "Niagara," flushing twice automatically every time they are used. The water for this and for laundry purposes is supplied by the water-works of the company in great abundance. At the head of each system of sewer-pipes there is a flushing tank containing one hundred and forty gallons, which, when full, empties itself by syphonage in about three minutes, carrying everything before it. The discharge can be made to occur at whatever interval seems desirable. At the well already referred to, into which the sewage is discharged, is a pump capable of forcing ten thousand gallons per hour. By means of this the sewage is driven into another pipe, which carries it to the farm, where it is incorpo-

rated with sea-weed and other material, as before described, to make compost. The enterprising agent, Mr. Hamilton, is considering the feasibility of distributing it by means of terra-cotta drain-pipes all over the farm, and thus still further diminishing the labor of its utilization. Should he succeed in this, the system will be automatic from beginning to end, with the exception of the pump, which can be worked at a comparatively small outlay. I have described these sanitary improvements thus in detail, in the hope of inducing the proprietors or authorities of other resorts upon this coast to imitate them. Land for the purposes of a farm can usually be had at a very moderate figure, and a perfectly healthful condition of the premises insured; not only without adding to the running expenses of the hotels, but at an actual profit.

1106 Walnut St., Phila., May 25, 1884.

A NEW LIFE-PRESERVER AT SEA.—One of the chief elements of danger to a good swimmer in a rough sea lies in the suffocating and stupefying effects of the waves breaking over his head. Even when the body is suspended by a life-belt, drowning frequently results from the force of the sea; and to provide against this, William Wilkins has invented a new life-preserver, consisting of an atmospheric helmet and belt. The helmet is provided with ample arrangements for sight, speech and respiration, and both it and the belt are divided into two compartments, the buoyant power of either of the four compartments alone being sufficient to prevent the wearer from sinking. Indeed, it has been calculated that the weight of a man in the sea, when fully dressed, is only six pounds, while the belt will sustain forty pounds and the helmet twenty pounds. Both helmet and belt can be inflated and put on in about three minutes. This new life-preserver was exhibited at the Fisheries Exhibition, but has recently been considerably improved in many minor points. In a trial in a rough sea, off Brighton, its efficiency was fully demonstrated, and it seems likely that the invention will be found particularly useful to members of life-boat crews, who at present are often washed out of their boats and drowned, although provided with cork jackets.—*Cassell's Family Magazine.*

THE FIRST STEAMER TO CROSS THE OCEAN.

We extract the following from the *Brooklyn Eagle* (of June 8, 1884), which, by the way, all things considered, is the best newspaper published in the United States:

"One of the most curious things in the history of transatlantic steam navigation is the claim that has been set up on the other side of the water to the construction and fitting out of the first of pioneer transatlantic steamers, or more strictly speaking, to the proprietorship of the first vessels which crossed the ocean propelled exclusively by steam power. These pioneers, it is claimed, were the Sirius and the Great Western, the former built for another class of voyages and afterward lost on the station between Cork and London; the latter built expressly for Atlantic navigation. They made the voyage in 1838, which, as will be seen, was twenty years too late for pioneers. If 'exclusively propelled by steam power,' as is urged for them, means that no sails were set during the passage, the claim may be founded on fact, but that it is deceptive and misleading there is surely no doubt. The Savannah, an American steamship, was surely the first ever built to cross the ocean, and, if she carried auxiliary sails and set them when the wind was fair, she did no more than every steamer has done from that time up to the present, and could by no means be forced on that account to forego her claim to being the first steamship that crossed the seas. She was built in 1818 by Col. John Stevens, of New York, and the news of her master's intention to tempt the seas soon reached the English world, being heralded by the *London Times* in its issue of May 11, 1819, in the following paragraph: 'Great experiment.—A new steam vessel of 300 tons has been built at New York for the express purpose of carrying passengers across the Atlantic. She is to come to Liverpool direct.' This was the Savannah, which, in May, 1819, left the port of New York, under the command of Captain Moses Rogers, bound for St. Petersburg *via* Liverpool. She reached the latter port on June 20, having used steam eighteen days out of the twenty-six and thus

proved the feasibility of transatlantic steam navigation. The logbook of the Savannah, in which Captain Rogers jotted down the incidents of the trip, is yet preserved by his descendants.

It is a curious collection of coarse, unbound paper pages, written in a bold and intelligible hand. On the first page is the following: 'A journal of a voyage from New York toward Liverpool on board steamship Savannah, Moses Rogers, master.' Here is the first entry in the log-book: 'Sunday, March 28, 1819—These twenty-four hours begin with fresh breezes at Northwest. At 10 A.M. got under way for sea with the crew on board. At 1 P.M. the pilot left the ship off Sandy Hook light.' The second entry reads: 'Remarks on board, Monday, March 29, 1819. These twenty-four hours begin with fresh breezes and clear. At 4 P.M. the Highlands of Neversink bore north by west six leagues distant, from which I take my departure. At 10 P.M. took in top-gallan' sails. At 8 A.M. tacked ship to the westward. Saw a brig and schooner steering to the westward. At 11 A.M. took in the mizzen and fore top-gallan' sails. At 11 A.M. got the steam up and it come on for to blow fresh. We took the wheels in on deck in thirty minutes. At meridian to-day fresh breezes and cloudy. Latitude by observation, 39 degrees, 19 minutes.' It seems that the Savannah was so constructed that, when there was a heavy sea running, the paddle-wheels could be taken in on deck. This was done by rigging a sling from the main yard, which being swayed about, could be forced first over one wheel and then over the other. Now began a short season of very rough weather, during a part of which the Savannah was hove to. On the following Saturday, however, the weather being moderate, the wheels were again shipped and the vessel proceeded under steam.

After an uneventful voyage the coast of Ireland was sighted, and early one morning the Savannah approached the land. That afternoon she was boarded by the King's cutter, Kite, Lieutenant John Bowie. The log-book says little about this, but Moses Rogers' brother Stephen wrote an account of this amusing incident, which was published in the *Gazette*, of New London, Conn. He says: 'She (the steamer) was seen from the telegraph station at Cape Clear, on the southern coast

of Ireland, and reported as a ship on fire. The admiral, who lay in the cove of Cork, dispatched one of the king's cutters to her relief. But great was their wonder at their inability with all sail, in a fast vessel, to come up with a ship under bare poles. After several shots were fired from the cutter the engine was stopped, and the surprise of her crew at the mistake they had made, as well as their curiosity to see the singular Yankee craft, can be easily imagined. They asked permission to go on board, and were much gratified by the inspection of this naval novelty.' Two days later, according to the log, they shipped the wheels and furled the sails and ran into the River Mersey, and at 6 P.M. came to anchor off Liverpool. Captain Rogers seems to have been as modest as he was daring, for, though having succeeded in an attempt to navigate the ocean with paddle-wheels, which many of the ablest mariners and scientists had declared perilous if not impossible, he only jots down in his log-book a few dry details of his safe arrival, with never a comment.

A distinguished scientist had declared long before that it was not possible to cross the ocean by steam. Indeed, so sure was he that it could not be done that, when he heard that Captain Rogers proposed to make the attempt, he declared that he would swallow the first vessel that should safely reach the British Isles from this country. It would not, therefore, have seemed immodest had Captain Rogers, upon the arrival of the Savannah, have called upon the savant to fulfill his promise and swallow the ship. Fortunately, the aforementioned Stephen Rogers wrote an account of the scenes along the quays and river when the steamship drew near the shore. He says: "On approaching Liverpool, hundreds of people came off in boats to see the steamship. She was compelled to lie outside the bar until the tide should serve for her to go in. During this time she had her colors all flying, when a boat from a British sloop of war came alongside and hailed. The sailing master was on the deck at the time and answered. The officer of the boat asked him, 'Where is your master?' to which he gave the laconic reply, 'I have no master, sir!' 'Where's your captain, then?' 'He's below. Do you wish to see him?' 'I do, sir.' The captain, who was then below, on being called, asked what he wanted, to which the officer an-

swered, 'Why do you wear that pennant, sir?' 'Because my country allows me to, sir.' 'My commander thinks it was done to insult him, and if you don't take it down he will send a force that will do it.' Captain Rogers then exclaimed to the engineer, 'Get the hot water engine ready!' Although there was no such machine on board the vessel, the order had the desired effect, and John Bull was glad to paddle off as fast as possible. On approaching the city the shipping, piers and roofs of houses were thronged with persons cheering the adventurous craft. Several naval officers, noblemen and merchants from London came down to visit her, and were very curious to ascertain her speed, destination and other particulars.'

It is curious, in looking over the English newspapers of this time, to see how suspiciously the English authorities regarded the American steamer. America was looked upon as very ambitious, and an enterprise like this on the seas filled the British breast with great alarm. It seems that Napoleon, being now in captivity at St. Helena, his brother had offered a large reward to whoever should rescue him, or rather, there was, it would appear, a rumor to that effect, and the British press was sure that this Yankee steamer was in European waters for no other purpose. The Savannah remained nearly a month in British waters, and while there Captain Rogers had jotted down in his log the following note of an unfortunate occurrence. It is here given literatim: 'July 19, 1819. These twenty-four hours begin with fresh breezes and rain. Captain Rogers told Mr. Blackman to go on shore after James Bruce and John Smith to get them on board. They would not come; the watchman put them in the boat. John Smith tried to knock Mr. Blackman overboard; Struck him several times; he Swore he would take Mr. Blackman's life, but Mr. Blackman got him on board, and he denied his duty, and then he was put in irons. Middle and latter part fresh gales at S. W. and rain.' On the 23d of July the Savannah set out for St. Petersburg under steam. She stopped at Copenhagen and also at Stockholm, where, as in England, she was the object of general attention, being visited by all the members of the royal family and the nobles. Captain Rogers' diary says: 'Mr. Huse (Christopher Hughes), the American Minister, and Lady and

all the Furran minersters and their Laydes at Stockholm came on board.' At St. Petersburg, where the steamer arrived in the early part of September, she was visited by the Lord High Admiral and members of the royal family. She sailed for America on October 10, and reached Savannah, Ga., November 30. While at Stockholm, Captain Rogers took aboard as an invited guest Lord Lynedock, an English nobleman, who made the journey to St. Petersburg aboard the steamer. When he left the ship he presented Captain Rogers with a massive gold-lined teakettle. This teakettle is yet preserved by the descendants of Captain Rogers. It bears the following inscription:

'Presented to Captain Moses Rogers, of the steamship Savannah (being the first steam vessel that had crossed the Atlantic), by Sir Thomas Graham, Lord Lynedock, a passenger from Stockholm to St. Petersburg—September 15, 1819.'

Thus, it will be seen that the Savannah, which, by the way, was lost off the south side of Long Island, anticipated the alleged steam pioneers Sirius and Great Western by nearly twenty years." N.

A SAILOR'S DESCRIPTION OF HIS BRIDE.—A member of the Seaman's Association, lately married, is reported to have given to his comrades the following description of his new craft: "My wife is just as handsome a craft as ever left a milliner's dry dock; is clipper built, and with a figurehead not often seen on a small craft. Her length of keel is five feet six inches, displacement, 27 cubic feet; of light draught, which adds to her speed in the ball-room; full in the waist, spare, trim. At the time we spliced she was newly rigged, fore and aft, with standing rigging of lace and flowers; main-sail part silk, fore-staysail of Valenciennes, and stu'n'sails trimmed with orange-blossoms. Her frame was of the best steel, covered with silk, with whalebone stanchions. The rigging is intended for fair weather cruising. She has also a set of stormsails for rough weather. I have been told that in running down street before the wind she answers the helm beautifully, and can turn around in her own length if a handsome craft passes.

THE MEDICAL COLLEGES AND PREVENTIVE MEDICINE.

A few months ago THE SANITARIAN ventured to raise the question: Whether Physicians are Essentially Sanitarians—based upon the general omission of instruction on Preventive Medicine in the medical colleges. Our statement that it was, at best, but very superficially taught in a few, and in these as an *addendum* to some other subject, had the effect of attracting the attention of several contemporaries, and some of them have essayed corrections. We have been gratified with the information that a few give full courses and require competency in this branch for the degree of M.D. Desirous of going to the bottom of the subject, but still believing our statement was in the main correct, and not having the curriculi of the *two hundred and eight* medical institutions in the United States which confer the degree of M.D. (according to the summary of the Illinois State Board of Health), we sought information from the Hon. Commissioner of Education, and have been favored with the following statement:

U. S. BUREAU OF EDUCATION,
Washington, June 2d, 1884.

Editor of THE SANITARIAN.

MY DEAR SIR: In reply to your query of the 24th of May, I would say that I have had the most recent catalogues of medical colleges carefully examined, and find that they contain the following information respecting instruction in hygiene. The rule adopted was to include all colleges that explicitly announced any professor or lecturer on hygiene in its faculty list; but to exclude all that merely announced vaguely that lectures on the subject would be given. Promises are plentiful, especially in the announcement of medical colleges:

Medical Dept. Arkansas Industrial University, Little Rock, Ark. John J. McAlmont, M.D., Prof. of Nat. Med. Therap., Hygiene and Botany.

Medical Dept. University of California, San Francisco, Cal. F. W. Hatch, A.M., M.D., Prof. of Hygiene, Sec'y State Board of Health.

Chicago Medical College (Med. Dept. N. Wn. Univ.), Chicago, Ill. O. C. de Wolf, A.M., M.D., Prof. of State Med. and Public Hygiene. This subject is part of middle (2d) year's course.

Chicago Homœopathic Medical College, Chicago, Ill. L. C. Grosvenor, M.D., Prof. of Sanitary Science.

Hahnemann Medical College, Chicago, Ill. Prof. of Med Jurisprudence and (Pub.) Hygiene.

College of Physicians and Surgeons of Chicago, Chicago, Ill. Romaine J. Curtiss, M.D., Prof. of State Med. and Hygiene; lives at Joliet, Ill.

Rush Medical College, Chicago, Ill. Norman Bridge, M.D., Prof. of Hygiene and Adjunct Prof. of the Principles and Practice of Medicine.

Central College of Physicians and Surgeons, Indianapolis, Ind. G. C. Smythe, A.M., M.D., Prof. of Prins. and Prac. of Med. and Sanitary Science.

Medical College of Indiana (Med. Dept. Butler Univ.), Indianapolis, Ind. Wm. B. Fletcher, M.D., Prof. of Physiology, Hygiene, and Clinical Medicine. Text Book, Parkes.

Boston University (Homœopathic); Boston, Mass. Elijah U. Jones, M.D., Lecturer on Sanitary Science, Sanitary Science in its relation to ventilation, drainage, etc., Malaria and Malarial Diseases.

Medical School of Harvard University, Boston, Mass. Samuel H. Durgin, M.D., Lecturer on Hygiene.

Michigan College of Medicine (1881–2), Detroit, Mich. Hygiene a study in last (3d) year. Texts: Wilson, Parks, Buck.

Minnesota College Hospital, Minneapolis, Minn. H. J Burwash, M.D., Prof. of Clinical Medicine and Hygiene; Parkes, Wilson, Rolen.

St. Louis Medical College (7th St. and Clark Ave.), St. Louis, Mo. W. E. Fischel, M.D., Prof. of Hygiene and Forensic Medicine; 2 lectures per week; half term on Hygiene, half term on Med. Jur.; is a three term school (three terms required for graduation.) Text books recommended are: "Wilson's Handbook," and "Parke's Manual."

Medical Dept. of Willamette University, Portland, Oregon. H. Carpenter, M.D., Prof. of Hygiene. Text Books, Parkes, Bowditch.

Homœopathic Medical College of Missouri, St. Louis, Mo. W. J. Harris, M.D., Professor of Sanitary Science.

Indiana Eclectic Medical College, Indianapolis, Ind. T. H. Stewart, M.D., Prof. of Sanitary Science and Hygiene. Text book, Parkes. One lecture per week.

Iowa College of Physicians and Surgeons, Des Moines, Iowa. L. C. Swift, M.D., Prof. of Physiology and Clinical Pathology, and Lecturer upon Hygiene.

College of Physicians and Surgeons, Keokuk, Iowa. A. G. Field, M.D., Prof. of Physiology, Pathology, General Therap. and Public Hygiene.

Hospital College of Medicine (Med. Dept. Central Univ.), Louisville, Ky. John J. Speed, M.D., Prof. of the Institutes of Med. and Pub. Hygiene, and Lecturer on Jurisprudence.

Medical Dept. University of Louisville, Louisville, Ky. T. S. Bell, M.D., Prof. of State Med. and Sanitary Science.

Medical Dept. of the University of Louisiana, New Orleans, La. John B. Elliott, M.D., Prof. of Materia Medica, Therapeutics and Hygiene. Text book, Wilson or Parkes.

Johns Hopkins University, Baltimore, Md. Surgeon John S. Billings, U. S. A., Lecturer on Municipal Hygiene.

Very respectfully yours,

JOHN EATON, *Commissioner.*

Another correspondent writes: Your strictures were well-founded, if applied to the practice prior to the session of 1883–84, but during the last session there was a marked and gratifying change. Prior to that session there were only 42 in which the subject was mentioned in the curriculum; and in the majority of these its teaching was, undoubtedly, as you say, very elementary. During the last year 64 colleges devoted more or less attention to the subject, and formally included it in the list of studies. Many more are including it in their announcements for the next session, among them the Jefferson, Ohio, Indiana, etc. Harvard has re-established it as a full chair, filled by Dr. Durgin. The University of Pennsylvania has also made it a full chair in the regular course instead of making it a preliminary study as heretofore. All of the Illinois colleges have chairs of hygiene, and include the subject in their examinations. The Chicago Medical College has done so for a number of years, and is the only one that did so prior to the last session.

THE PLEURO-PNEUMONIA BILL.

The Act of Congress (April 29, 1884), for the establishment of a bureau of animal industry and the extirpation of contagious cattle diseases, provides that:

The commissioner of agriculture shall organize in his department a bureau of animal industry, with a chief who shall be a competent veterinary surgeon, and who shall investigate and report the condition of the domestic animals of the United States and the causes of contagious, infectious and communicable diseases among them. He shall also collect such other information on those subjects as may be valuable to the agricultural and commercial interests of the United States. For the purposes of the bureau the Commissioner of Agriculture is authorized to employ a force not to exceed twenty persons at any one time. The salary of the chief of the bureau is fixed at $3,000, that of the clerk at $1,500. The commissioner is to appoint two competent agents who shall be practical stock-raisers or men experienced in commercial transactions affecting live stock, who shall report the best manner of transporting and caring for animals, and the means to be adopted to suppress and extirpate pleuro-pneumonia and other dangerous, contagious or communicable diseases. The compensation of such agents is fixed at $10 per day.

The commissioner is to prepare as early as possible such rules and regulations as may be necessary to extirpate the diseases named, and certify such rules, etc., to the executive authority of each State and Territory, and invite the co-operation of such executive authority in the execution of the Act of Congress. When the rules, etc., shall have been accepted by such executive authority the commissioner may expend in the State so accepting so much money as may be necessary for the purpose of the investigations contemplated by the Act, and for such disinfection and quarantine measures as may be necessary to prevent the spread of the disease from one State or Territory into another.

In order to promote exportation of live stock, special investigation shall be made as to the existence of contagious dis-

eases along the dividing line between the United States and foreign countries, and along the transportation lines from all parts of the United States to ports from which cattle are exported, and reports made to the Secretary of the Treasury, who shall co-operate with the State and municipal authorities, corporations and persons engaged in transportation of neat cattle by land or water, in establising regulations for the safe conveyance of the cattle and preventing the spread of the disease; and the Secretary of the Treasury is authorized to take such steps as may be necessary, not inconsistent with the Act, to prevent the exportation of cattle affected with any contagious diseases, especially pleuro-pneumonia. Transportation companies are forbidden to transport cattle affected with any contagious or communicable diseases from one State or Territory to another, but the so-called splenetic or Texas fever is excepted from the category of communicable diseases, so far as regards the transportation of the cattle to market. Violations of the act by railroad companies or vessels is declared a misdemeanor on the part of the manager or captain, punishable by fine not to exceed $5,000, or imprisonment not to exceed one year, or by both. It is made the duty of United States District Attorneys to prosecute the cases.

The sum appropriated for the purposes of the act is $150,000, (instead of $250,000 as appropriated by the House of Representatives.)

The Commissioner of Agriculture is required to report annually to Congress a full account of the operations of the bureau, a list of all persons employed, their compensation, etc.

DOCTORS' AND LAWYERS' FEES.—The Government has paid for one unsuccessful trial of the "Star route thieves" $144,146.92; of this Mr Bliss, of New York, received for his portion of the unsuccessful work $57,732.15, an average of $150 a day for fees, and $10 a day for expenses. And yet the small charge of Mr. Garfield's doctors was scaled far below $100 a day, *including expenses*, provided they would sign a receipt in full. The people and the press applauded. Even the medical press, in part, and medical men, thought it all right thus to defraud and degrade the medical profession. A record of shame.—*Gaillard's Journal.*

CONTAGIOUS AND INFECTIOUS DISEASES*.

By JOHN AVERY, M.D., of Greenville, President of Michigan State Board of Health.

Dr. Avery premised his position by the statement that all contagious diseases are infectious, and that all infectious diseases are contagious. These terms are now interchangeable, and are used by medical writers to denote a class of diseases having their origin in a specific poison taken into the system and containing in itself the germs of self-propagation. Thus the germs or virus of small-pox, etc. And so the poison of small-pox may be communicated directly from a person suffering from that disease to a well one, and thus be contagious; or it may be carried in the clothing of a protected person to an unprotected one, who will have small-pox, and so be infectious. This is true of other diseases of this class, and especially so of diphtheria and scarlet fever, two diseases Michigan people are most interested in preventing. We may say, then, that all contagious and infectious diseases are communicable, and that all communicable diseases are preventable.

One-third of all sickness and deaths in this country result from preventable causes, it is estimated. With a better knowledge of hygienic laws, many diseases could be prevented, and sickness and suffering greatly lessened and the average of life increased. Diphtheria, scarlet fever and small-pox are the most threatening of communicable diseases.

Typhoid fever might be added to the list, and recent investigations indicate that consumption will soon be added. If a person is taken down with small-pox, the knowledge that the case had its origin in a previous one leads the people at once to take measures to protect themselves against its further spread. This results from the positive knowledge that the disease is communicated from one to another, and that it can be limited and finally stamped out. If the same positive knowledge could be imparted to all, that diphtheria and scarlet fever are far more dangerous to life, just as communicable and just as preventable as small-pox, our mortality reports would not

* Abstract of paper read before Sanitary Convention at Ionia, Mich., Dec. 13, 1883.

show fifty deaths in Michigan from these two diseases to one from small-pox. It is now universally admitted that diphtheria is of a contagious character. Medical professors, scientists, and intelligent observers agree that it is communicable. My own belief is that each communicable disease has its own specific germ or seed, which ripens during the progress of the disease, and which, taken into a system properly prepared to receive it, will grow and multiply, and in due season bring forth fruit of its kind, and of no other. These germs will reproduce themselves; will live for an indefinite period, unless destroyed by heat or other active agent; and will, if allowed to spread, invariably produce the same disease under favorable circumstances, as the one from which they originated. These germs are minute particles of organic matter, probably living organisms, invisible to the unaided eye, very tenacious of life, will cling to the walls of the room of the sick, and to books, furniture, etc. They may be carried in the hair, clothing, etc., of attendants and visitors, and may be by the physician attending. They may be carried into and poison the water supply; may be carried into the dairy or milk closet, and taken into the system with the cream in our coffee, or fed to children in their bread and milk.

How may they be destroyed and their distribution prevented? The moment a case of diphtheria is recognized (as an illustration) the patient should be put to bed in the airiest, sunniest room; an abundance of air provided; let in the sunlight, and keep the temperature as near 65 to 70 as possible. The doctor then described the course of treatment that should be followed in handling the disease. The health officers should have no more hesitation in providing a place for the proper isolation and treatment of a case of diphtheria, or any other communicable disease, than they would have for the treatment of a case of small-pox, where it is not possible to follow the directions and secure the conditions described. In a case of the latter disease the community will compel the observance of these or similar precautions. Why not in case of diphtheria, scarlet fever and other communicable diseases where danger to health and life are much greater than in small-pox? As ordinarily used, disinfectants lull into false security, simply disguising one bad smell by substituting another. To attempt to

purify the air of a sick room, made foul by the exhalations of the breath, by the use of carbolic acid, etc., is simply to add to the danger instead of lessening it. Pure air in abundance, circulating freely, is the best disinfectant. Nothing else can take its place, and it costs nothing, except the effort to open the window. Fresh air is as necessary at night as in day, and is as pure. Additional covering may be required, but no less air. The precautions necessary to restrict diphtheria are applicable to all other communicable diseases. In typhoid fever the danger from direct contagion is probably much less than in most other infectious diseases, and entire isolation is perhaps not so necessary as in small-pox, diphtheria and scarlet fever; but the same care in the disposal of all excreta must positively be enforced. They contain the germs of the disease, and the excreta from a single typhoid fever patient, if carelessly disposed of, may poison the water supply of a hundred well persons, and give them the disease. While it is true that all communicable diseases have each its origin in a specific cause, it is also true that location and unsanitary surroundings have much to do in multiplying and intensifying that cause. Damp, unventilated basements, cesspools, stagnant water near houses, bad air in the rooms, seem to form a nest in which the germs of these diseases grow and multiply and increase in intensity, and when they seize upon their victim in such a locality, with a system already poisoned by the surroundings, the conflict is generally short; and the danger of infection from such a case is much increased. Pure air, pure water, dry and cleanly surroundings are safeguards that can no more be neglected in these than in other forms of disease. Practically, perhaps, all communicable diseases are only controllable; possibly preventable. We can, if we will, keep them within bounds, and, as the nature of their poison and its different modes of communication become better understood, may be able in time to altogether suppress them. Thanks to the great advance in medical and sanitary science, we know something of their origin, more of their nature and habits, and instead of accepting and patiently submitting to them as providence, to be borne, we look upon them as enemies to the peace and happiness of society, and demand their extermination.

ARTESIAN WELLS IN NEW YORK.

While the city authorities are engaged in devising means for a sufficient supply of pure water for the present and the future population of New York, it is interesting to observe what manufacturers and mercantile firms are doing for themselves in furtherance of business enterprise. Foremost among these, are the brewers of the city, almost all of whom now have artesian wells, or engaged in sinking them. Several dry-goods and other business concerns are adding to their facilities in the same way. Tracey & Russell are boring on the sidewalk of their big building on Greenwich avenue, and have gone as deep as 815 feet to find a flow of brackish water averaging about eight gallons a minute. They have been at it for about three months. They expect to sink a couple of hundred or more feet before they come to a good supply of clear, sweet water. George Ehret, on East Ninety-second street, is also sinking a well on his premises, and at a depth of 575 feet finds a flow of about one thousand gallons an hour of brackish water. At a depth of 430 feet Mr. Button, the driller, struck a stream of living water from the East River, the trend of which was from northeast to southwest. He thought it flowed from the vicinity of 100th street toward the rocky ridge of Fourth avenue, and then took a turn, and a few blocks south of Ninety-second street, flowed back to its source. Twenty or thirty years ago a large part of the territory east of Third avenue was covered by the water of the East River, and this avenue itself was at certain points fenced in from the river. In the well that is being sunk for Mr. Ehret it is found that the rise and fall of the water corresponds with the ebb and flow of the tides in the river.

At the depth of about five hundred and twenty feet another stratum has been struck. But the water in this is also brackish, and is evidently from the river. At the depth of 575 feet it was of the same character, but with an increased mixture of sweet water. The drill at last accounts was working in beautiful white granite, the dust of which was almost as pure as snow. Nothing like it is said to be known in this country. It

appears to run in transverse layers, and when struck in one direction easily chips off, but in another it is so hard as to almost defy the drill. Just before this granite was struck a layer of asbestos was met, which gave the drillers some trouble, because of its elastic character. At the depth of 800 feet Mr. Button expects to strike below the limestone bed of Ward's Island, and to obtain an abundant supply of pure drinking water. This will be tapped at its own level for brewing purposes, while the brackish water will be tapped at the higher level for lavatory and other uses. He has been over two months on the present bore. Mr. Button thinks that the city could very greatly increase its water supply by sinking a series of wells at different points between Twenty-third street and the City Hall, where the water level is reached at a relatively small cost and little depth. The supply from such wells could be utilized by the Fire and Street Cleaning Departments, and by manufacturers, livery-stable keepers and others. As the city extends its area and increases its population, Mr. Button believed the necessity for this increased supply will be more and more realized.

NOURISHING BREAD.

Peas, beans, lentils, vetches, and all the seeds belonging to that class used as vegetables, contain rich nourishing matter, in the same proportion as the best grains. The special nourishing azotic matter found in grains, as gluten in the cereals, albumen in the egg, casein in milk, musculin in meat, differs in those seeds, according to the kind, from twenty-four to thirty-one per cent.; the fecula and its derivations, the dextrine and glucinum, from forty-nine to fifty-nine per cent.; the fat phosphorated in one part from 2 to 2.8; the mineral matters from 2.1 to 3.5; the cellular matter forming the weft of the seed is similar in its chemical composition to the fecula and dextrine, from 1 to 3.5; and lastly, the water from ten to fifteen per cent. These seeds are therefore very nourishing food. It will be of great value to know that the juice of these seeds, when cooked, contains the same rich aliment. It is only necessary to take

care that peas, beans, lentils, etc., are not to be put into boiling water, as that would cause them to harden instead of soften, and prevent a solution of the vegetable. The water must contain as little lime as possible, and the vegetable must be put into it before it commences to heat. Legumens are especially valuable on account of the peculiarity of having the richest phosphoric parts of all substances in the group of albumens which form for mankind the complete aliment for the constitution, as well as for the nervous system. Especially is such food nourishing to the brain.

Comparing grains with legumens, we find that the former contains fifteen per cent. of the albuminous azotic substances, similar in their constituent parts and nourishing qualities to the albuminous fibrin, casein, musculin and legumen. The principal albuminous substance of grain is gluten; called also fibrin of gluten, or vegetable fibrin, in the same way as the legumen has been called vegetable casein. The gluten in the cereals represents the legumen of peas, beans, lentils and other seeds of the same vegetable kind. These two substances are considered to be of the same nourishing value, except that the legumen is richer in phosphorus than the gluten. The grain contains 60 per cent. of fecula, 7 of gluten, 1.2 of fat—of which one part is phosphorus, similar to the legumens—1.6 of mineral matter, 1.7 of cellular matter, and 14 per cent. of water. Thus we see that the proportion of nourishing matter in the leguminous seeds is from 24 to 31 per cent., while the nourishing substances of grain do not exceed 15 per cent. From this we may infer that bread made from the meal of peas, beans or lentils would be more nourishing than our bread made from grain.—*American Miller.*

I AM largely employing the Milk Food manufactured by the Anglo-Swiss Condensed Milk Company, especially in the Infants' Hospital at St. Alban, and am very well satisfied with the result.. It is my opinion that this preparation completely fullfils all the requirements that can reasonably be asked of an Infants' Food.

Basle, March 3, 1881. Dr. E. MAEHLY.

EDITOR'S TABLE.

LEPROSY.—Besides the paper of Dr. Farquharson, on other pages of this number, which doubtless will, as it ought to, attract the attention of sanitarians throughout the country, we have before us a pamphlet reprint from the *Journal of Cutaneous and Venereal Diseases*, of a report on the same subject by Dr. Ch. Grönvold, member of the State Board of Health of Minnesota, to which Dr. F. refers. Dr. Grönvold's report covers the period from 1869 to 1883, and is remarkable for the statement of facts in this relation, which he appears to have been the first to elicit. His report opens with the statement that:

"As early as 1864, the condition of the lepers among the immigrants to the northwest has been an object for the attention of medical men from their old country. In that year Dr. J. H. Holmboe, surgeon in charge of the Hospital for Lepers in Bergen, Norway, visited this country to study the influence change of climate and other relations had on the development of the disease.

He found 12 cases, of which 2 had originated in this country, while one, who came here leprous, had got well. His impression was that their condition of health was better than it would have been if they had stayed in the old country.

In 1869–70 the settlements were again visited by a medical gentleman from the old country, the late Professor William Boeck, of Christiania, Norway, well known in medical literature for his writings on leprosy and syphilis. The result of his investigations in the northwestern settlements may be read in "Nordiskt Medicinskt Archiv.," Band iii., No. 1.

He found in the three States, Wisconsin, Iowa and Minnesota, 18 cases of leprosy, all which had come from those parts of the Norwegian western seacoast where the disease is endemic. . . .

In regard to the time of the appearance of the disease, in 9 it commenced already in the old country, and of these, 5 had lepers in their family, while 4 did not know of any leprous relation.

In the other 9 cases the disease first commenced in this country. Of these 8 had lepers in their family, and the disease broke out respectively 2½, 3, 3½, 5, 6, 8, 9½, and 10 years

after their arrival. These 8 cases that were developed on American soil may depend upon heredity; or they may have been caused by contagion in the old country, the only place where it is possible that they could have met with other lepers; or the disease may have developed from a miasma in the old country. Either of the last two suppositions being right, the time of the incubation will for two of the cases be 9½ and 10 years. Professor Boeck considers them all as depending upon heredity, in direct or lateral line. If he had any doubt, he says, in regard to propagation of the disease by heredity, these cases would have convinced him. . . .

The last of the nine cases developed on American soil did not know of any leprous relation, and may possibly be referred to contagion. . . .

Since Professor Boeck's visit in 1869–70, investigations have been continued in Minnesota regarding the occurrence and character of the disease in that State. At present, six cases and their whereabouts are known, all immigrated from that part of western Norway where the disease is endemic. . . .

Ten lepers of the immigrants are known to have died in Minnesota since the settlement of the country, all of them males. Of these, seven have died in the last seven years. . . .

All of them had lepers in their families; 3 of them had the disease in the old country, 3 got it here—2, 10 years and 1, 3 years after their arrival. . . .

The suggestion of the above facts, as far as they go, seems to be that the disease is not so easily acquired here in the Northwest as in the old country, be it by heredity or contagion. The dry climate is, possibly, not so favorable for the development and the communication of the disease that at present mostly belongs to the seacoasts and islands. The chances of contagion are decidedly less here than in the old country; there is greater cleanliness, as a consequence of the greater economical prosperity, and the new-built houses of the first settlers in a new country furnish no filthy nests for contagion.

But, once acquired, the disease seems to run its regular course without abatement."

This disease was once so prevalent in Europe that there were estimated to be not less than 150,000 cases. It was introduced into England by the Crusaders during the reign of Henry I., and became so prevalent that half of the hospitals in the kingdom were filled with it, to the exclusion of other diseases, and in the latter part of the twelfth century the lepers were empowered to erect churches for themselves and have their own ministers.

POWERS OF TOWN BOARDS OF HEALTH.—New York Supreme Court: New York Infant Asylum *vs.* Board of Health of Town of East Chester. The local Board of Health in the town of East Chester, during the prevalence of an epidemic of measles and diphtheria, visited the institution and ordered the resident physician to remove sick children from the quarantine tents, where they had been placed by the medical men in charge, into other wards; interfered with the resident physician, and criticised her treatment and competency. The institution obtained an injunction restraining the Board from all interference with its medical officers. On motion to vacate the injunction, held by Dykman, Justice, "That a Town Board of Health has the right to visit and inspect a public institution, to inquire if any epidemic or infectious disease is prevailing, and may take such precautionary measures as would best prevent its spread from the institution to the inhabitants of the town. It has no right to interfere with the patients, or with the treatment of cases, nor to criticise the treatment or competency of the physicians of the institution, nor to touch anything on the premises. Ordering the removal of sick children by the local Board of Health, from the quarantine tents where they were placed by the regular physicians in charge, was an unwarrantable act and a trespass. It is no part of the duty of a Board of Health in a town to investigate as to alleged incompetency of physicians in an institution, or the propriety of treatment, or the medical or other management. That is the affair of the institution, which is a body organized by law. The town Board of Health has the simple right of visitation for the purpose of inquiring into the existence of an infectious disease, and if found to exist, then only to take proper steps to prevent its spread outside the institution. The injunction granted to restrain the Board of Health from interfering with the institution or its physicians should be made permanent."

SANITARY FOREST CULTURE.—At the recent meeting of the Massachusetts Medical Society, June 10–11, Dr. J. F. Adams read a paper on Sanitary Forest Culture. It had been only recently recognized that the presence of forests has a marked effect on the flow of streams, moderation of climate, and prevention of malaria. Forests act as reservoirs and distributors of

moisture by allowing more water from rain and snow-falls to soak into the ground, thus preventing freshets and extremes of high and low water. In Europe it is noticed that the variation in the rise and fall of rivers is much greater than formerly. Forests also serve to break the force of winds and distribute moisture

It had been repeatedly shown in this country and Europe, that cutting away forests had, in many places, increased the prevalence of malaria, while many malarial districts are rendered habitable by planting rapidly growing trees. The reader recommended that the State take measures to awaken a knowledge of the importance of the subject in public minds, pass laws to protect existing forests, and establish a school of forestry on the plan of those in Europe. Many waste lands in the country could be made to yield a good interest if properly planted.

Dr. H. O. Marcy spoke of the importance of steps being taken for the preservation of the Middlesex fields. An excellent opportunity was there offered for the systematic cultivation of forest trees. Dr. A. H. Blodgett spoke of the manner in which forestry is taught and applied in Germany, where in certain districts, forming water-sheds to important streams, no trees can be cut without permission from the government forester.

On a motion of Dr. Millett the Society passed an unanimous vote referring the subject to a committee, with instructions to present it to the Legislature and urge the passage of suitable laws on the subject.

UNDERTAKERS' ICE.—A newspaper report from Camden, N. J., states that scarlet fever has been spread in Gloucester City by children having eaten ice which had been used by the undertaker on the body of a person dead of that disease.

M. D.'S.—On the showing of the Illinois State Board of Health, not less than two hundred graduates of medicine, who have fallen under its purview, cannot spell correctly the word diploma. The following are seven of the different attempts by candidates for practice under the State law: Diaploma, diplomy, diplomer, diplomah, diaplemy, diapluma, dipluma. Alas, for a profession so learned!

PHYSIOLOGY AND HYGIENE IN THE PUBLIC SCHOOLS.

At a recent meeting of the New Orleans Auxiliary Sanitary

Association, Professor Stanford E. Chaillé moved a petition to the Legislature of Louisiana, to take such action as would make the teaching of Physiology and Hygiene in the public schools obligatory throughout that State, as it had been made by acts of the legislatures recently in several other States, and with *special reference to the effects of alcoholic drinks and narcotics upon the human system.*

This action of the Sanitary Association was endorsed by the State Board of Health, the State Medical Society, the Orleans Parish Medical Society, and the Louisiana Educational Society. The Louisiana State Medical Society made the following appropriate addition to the petition:

"All men, who have devoted study to the subject, have become convinced that not only public wealth, but also public morality, depend to a large extent on public health, and that the progress of this depends on gradually replacing the present gross ignorance and baneful prejudices of the people with sound knowledge of at least the elementary laws of hygiene. On this subject that profound philosopher, Herbert Spencer, teaches as follows:

"'Knowledge which subserves direct self-preservation by preventing loss of health is of primary importance. We do not contend that possession of such knowledge would by any means wholly remedy the evil. For it is clear that, in our present phase of civilization, men's necessities often compel them to transgress; and it is further clear that even in the absence of such compulsion, their inclinations would frequently lead them, spite of their knowledge, to sacrifice future good to present gratification. But we do contend that the right knowledge impressed in the right way would effect much; and we further contend that *as the laws of health must be recognized before they can be fully conformed to, the imparting of such knowledge must precede a more rational living*—come when that may.'

"On this same subject the distinguished moralist, the Rev. Charles Kingsley, declared that 'the art of keeping one's self alive and well, will in some *more civilized* age and country be held a necessary element in the school course of every child—just as necessary as reading, writing and arithmetic.'

"In fine, at the present day all those most eminent as students of educational problems unite with sanitarians in insisting that the knowledge of hygiene should be popularized; that it should be taught sufficiently to convince men that health and disease are, to large extent, in their own hands; that, among other means to this end, there is one which is indispensable, and that this one is the teaching of hygiene in all

schools, and especially in the public schools. A beginning must be made, and the sooner the better for the common weal of Louisiana."

NEW YORK PHYSICIANS' MUTUAL AID ASSOCIATION.—Fifteenth annual report, 1883. The present membership of this association is 448. The accumulated fund at the disposal of the association, $10,661.62. Of seven deaths of members reported upon during the year, the largest sum paid in by any one of them during his period of membership was $178, and the smallest sum $14; none of the families of the deceased received less than $425. The amount now available to the heirs of deceased members is $450, and it will soon be raised to $500.

It is surely a matter of very great surprise, considering that there are in New York, Brooklyn and Jersey City about 3,000 physicians, only about one in six of them are members of this association. The terms of membership are: *One* dollar from those admitted *under* 50 years of age, and *two* dollars from those admitted *over* 50 years of age, on the death of any member. By which the largest amount of assessment, for the year 1883—on seven deaths—was but $14; and, as above noted, of the deceased, the largest amount paid in during the whole period of membership was only a little more than *one-third* of the amount paid to his heirs. Arthur Mathewson, M.D., Cor. Secretary, 139 Montague street, Brooklyn.

£1,000 PRIZE.

The Worshipful Company of Grocers' First Quadrennial Discovery-Prize of £1,000, 1883–1886, in aid of original research in sanitary science, have announced the following problem:

"To discover a method by which the vaccine contagion may be cultivated apart from the animal body, in some medium or media not otherwise zymotic—the method to be such that the contagion may, by means of it, be multiplied to an indefinite extent in successive generations, and that the product after any number of such generations shall (so far as can within the time be tested) prove itself of identical potency with standard vaccine lymph."

The prize is open to universal competition, British and foreign.

Competitors for the prize must submit their respective treatises on or before the 31st of December, 1886; and the award will be made as soon afterwards as the circumstances of the competition shall permit—not later than the month of May, 1887.

In relation to the Discovery-Prize, as in relation to other parts of the company's scheme in aid of sanitary science, the court acts with the advice of a scientific committee, which at present consists of the following members: John Simon, C.B., F.R.S., John Tyndall, F.R.S., John Burdon Sanderson, M.D., F.R.S., and George Buchanan, M.D., F.R.S.

All communications on the subject are to be addressed to the clerk of the Grocers' Company, Grocers' Hall, London, E.C.

THE BOYLSTON PRIZES.—The questions proposed for the year 1885 are the following: 1. The Alleged Recent Reappearance of Intermittent Fever in New England, its History and the Pathology of the Disease—prize, $250. 2. The Best Preliminary Education for the Study of Medicine—prize, $200. The questions proposed for the year 1886 are: 1. The Influence of the Soil as a Factor in the Causation and Spread of Typhoid Fever—prize, $350. 2. The Relation of Hospitals to Medical Education—prize, $200. The essays should be sent in before the first Wednesday in April of each year. Further information may be had of Dr. W. F. Whitney, Harvard Medical School, Boston.

A REWARD OF $100,000 is provided for in a bill recently introduced into the United States Senate to any person who shall discover the true germ of yellow fever, or any certain way of preventing or materially modifying the spread of the disease.

THE "SANITARY ENGINEER" ON SANITARIANS.

Dr. BENJAMIN WARD RICHARDSON, who, by his lectures and writings, has contributed more to the advancement of sanitary knowledge than all the trade journals in the universe, is pronounced by the *Sanitary Engineer* to be "an unquestionably clever and suggestive writer, but a theorizer who deals in generalities. . . . . On many questions his judgment should be taken with some allowance, and notably on sewerage systems."

Dr. JOSEPH HOLT, known to all sanitarians in this country as one of the most indefatigable practical promoters of public

health in New Orleans, is also made the subject of animadversion. His vigorous words on assuming the Presidency of the Louisiana State Board of Health are said to "sound more like the cant of a ward politician than what should come from the president of a board of health." And because Dr. Holt, fortified by a practical experience of many years, ventures to assert his faith in the dangerous relations of yellow fever to filthy surroundings, in a congenial climate, no less than to importation, and that filth should, therefore, be the object of an exterminating warfare, the *Sanitary Engineer* suggests that "the inference is that quarantine will not receive much attention."

THE EXECUTIVE OFFICERS OF THE STATE BOARDS OF HEALTH, who have recently organized a conference with a view to such concert of action and co-operation among themselves as may be mutually beneficial in the exercise of their special duties as State sanitary officers, are charged by the *Sanitary Engineer* with being influenced by disappointed and revengeful motives against the American Public Health Association for not having made them officers of that body.

We confess to an inability to appreciate the standard of comparison upon which our contemporary bases such opinions. That there may be honest differences of opinion among sanitarians—no matter whether journalists or State officers—as among other men, in regard to the best means of gaining the same end, is unquestionable. An appreciation of this truth is the mainspring of this State Boards of Health organization. Most of those who constitute it have been more or less identified with all the progress sanitation has made in this country. To charge them with being influenced by such ignoble motives as those alleged, appears to THE SANITARIAN to be so unjust and far-fetched as to have no relation whatever to the cause of public health. The intimation is evidently the outcome of a judgment based upon self as the standard, and, on an accepted authority, those who make such comparisons are not wise. But

> "Every man hath business and desire,
> Such as it is."

PROF. D. W. YANDELL AND THE LOUISVILLE MEDICAL COLLEGE.

THE SANITARIAN thoroughly agrees with the following from the *Medical News:*

We know of nothing in Professor Yandell's long professional career that has done him more credit. He managed his case skillfully, tastefully, and very creditably. There was not a harsh expression in the whole of his rejoinder. He stood entirely aloof from all such methods. His rejoinder reminded us of the beautiful response made by Pelletier to the grumblings of old man Sequin, who growled because Pelletier succeeded in making sulphate of quinine, in which Sequin, after much labor, had failed. Pelletier showed that he was not only an able chemist, but possessed all the graces of a gentleman. Another similar case was that shown in the controversy between the accomplished Scott Alison and the erudite John Hughes Bennet, upon the subject of blood-letting in pneumonia. Neither of these renowned men had any reason to be ashamed of his work. When Professor D. W. Yandell stands as a worthy companion with such men as Pelletier, Scott Alison and John Hughes Bennet, he has full reason to be proud of his position. He has commanded the approval of his medical brethren throughout the Union. He worked in the very spirit so beautifully portrayed by Addison:

> "'Tis not in mortals to command success,
> But we'll do more, Sempronius, we'll deserve it."

We submit in its fullness this comprehensive, clear, unmistakable verdict. It fully sustains Professor David W. Yandell in the course he took in this important feature of medical integrity and honor.

THE MEDICAL ASSOCIATION OF ALABAMA has set an example worth following. At its meeting in April it struck the Louisville Medical College off the list of Reputable Medical Colleges.

DR. NATHAN ALLEN.—"Our Gallery" is the taking headline of an attractive feature of our esteemed contemporary, the *New England Medical Monthly*, under which it gives monthly a portrait and biographical sketch of some distinguished physician. The February number is worthily embellished by a fine portrait of Dr. Nathan Allen, so long and so well known by his good works, and by no means a stranger to our readers. To him more than to any other belongs the special honor of being the first to introduce physical culture into our high

schools of learning—first into Amherst College in 1856, while he was one of the trustees of that institution. It would be an easy matter for us to fill several pages in recounting the places of honor Dr. Allen has filled and how he has honored them by his contributions to social science in its various aspects. The most we can do at present is to emphasize this reference to our esteemed contemporary.—The May number is embellished with the portrait of Prof. HENRY F. CAMPBELL, of Augusta, Ga., who has just been elevated to the highest honor of the medical profession in this country—President of the American Medical Association; and the June number, just received at the time of this writing, with the portrait of Prof. LEWIS A. SAYRE.

Dr. A. P. BROWN, in his presidential address before the Texas State Medical Association, maintains the dignity of the medical profession and the independence of mankind of all lower organisms, as the verified truths of all substantial progress in human welfare.

THE INTERNATIONAL CONGRESS OF HYGIENE will meet at the Hague August 21. Dr. Van Overbeek de Meijer, Professor of Hygiene at Utrecht, is Secretary. The Dutch Minister of the Interior is Honorary President. Drs. Koch and Pasteur, and Dr. Stephen Smith, of New York, are expected to be present and read papers.

QUARANTINE SERVICE ON THE RED SEA is urged by the French medical journals as a precaution against conveyance of cholera into Europe by ships through the Mediterranean by way of the Suez Canal.

CREMATION is evidently gaining ground. A project is on foot for building a crematory at Bordentown, N. J., the locality being chosen with special reference to the convenience of both New York and Philadelphia.

THE IMMIGRATION OF INSANE PAUPERS has increased to such a degree that the N. Y. State Board of Charities has asked the co-operation of the Commissioners of Public Charities and Correction of New York, in an attempt to secure such legislation as may be necessary to prevent, or at least to mitigate the evil.

TEMPERANCE AND LONGEVITY.—It is reported of the late Bishop Smith, Senior Bishop of the Protestant Episcopal Church, that besides never having used alcohol or tobacco, he

possessed the more unique distinction of never having taken a dose of medicine until during his last and fatal illness.

NEW YORK AND BROOKLYN.—This is the season of the year which, more than any other, seems to stimulate the vigilance of the health authorities of these two cities. A few months ago the *New York Real Estate Chronicle* drew the following comparison, which still holds good, excepting that in neither is the rate of mortality now so great:

"Tables are furnished by the Board of Health, intended to show the comparative healthfulness of six leading European cities with six large cities in this country. According to these tables the death-rate per thousand in New York is greater than that of any of the European capitals named, and is also considerably higher than the rate in either of the American cities. This is no news; but there is one feature in the showing to which we wish to call attention.

"The rate per thousand in New York, which is 29.64, is considerably higher than the rate in Brooklyn—reported at 24.84 per thousand. Now, New York and Brooklyn are only like different sections of the same city. They are subjected to the same climatic laws, and, in a general way, are affected by the same local influences. If the tables of the Board of Health are correct, the difference in mortality must, therefore, be largely due to different modes of life, and to differences in the habits of the people of the two cities. Brooklyn is less crowded than New York, and the tenement-house system at the other end of the bridge has not been developed to the pre-eminence which it has reached in this city. Were the unhealthfulness of New York due to malaria emanating from natural fountains, Brooklyn should be the more unhealthful city of the two. She is in closer neighborhood with flat, low and badly drained lands, and should suffer the first and most prolonged visits from the ague, and its country cousins answering to the various names known best to physicians.

"There can be but one cause for the lighter death-rate of Brooklyn, and this is a cause largely under the control of this same Board of Health which makes the report. If it is a question of cleanliness and ventilation—and no other cause than filth and bad ventilation for the unhealthfulness of New York, in comparison with Brooklyn, can be suggested—the health officers have only to exercise more vigilance in the discharge of their duties. It may be claimed that crowded tenement houses cannot be made so healthful as separate dwellings in more open and airy localities. This is a very doubtful claim, however, if the airy locality is on the border of some swamp, or something else equally insalubrious. At all events the effort at purification is worth making."

CITIES WITHOUT SEWERS.—St. Petersburg, with a population of nearly 1,000,000, and the high death rate of 35.2 per 1,000, is without sewerage, and its water supply is taken from the river Neva, more or less contaminated by percolation from the subsoil. Cairo, with a death rate of 37 per 1,000, is supplied with water from the Nile, having no sewers, and the sewerage filtering through the subsoil into the Nile above the water in-take. Vienna, with a death rate of 29.2 per 1,000, has an average of 60 people in each house, or twice as many as in Paris, while the ratable value of the houses in Vienna is only one-sixth more than in Paris. Pekin, with a death rate of 50 per 1,000, is without proper sewerage, water supply, street cleansing, or other proper sanitary arrangements. New Orleans is without sewerage, has a population of 234,000, and an annual death rate (in the absence of yellow fever), of about 33 per 1,000, while there is probably no city in the world which gives more attention to public sanitation.

Parallel death rates to the above named cities might possibly be selected among the sewered, but from among those only which have old and imperfect systems. The latest scientific sewerage systems have been applied in comparatively few large cities, but in these are to be found the lowest death rates.

STATE AND LOCAL BOARDS OF HEALTH REPORTS.

CALIFORNIA.—Twenty-three localities with an aggregate population of 393,300, report for the month of April 595 deaths—an annual ratio of 18.48 per 1,000. Of the total number, 504, or a little over 90 per cent. of the whole, occurred in five principal cities—San Francisco, Oakland, Sacramento, Los Angeles and Stockton. The death rate of these was 17.47. A notable feature is the general absence of zymotic diseases. No disease prevailed in epidemic form during the month.

CONNECTICUT.—The month of April was unusually healthy. The highest rate was less than 20 per 1,000, while the general average was barely 15. The decrease was due in a great measure to the lessened mortality from pneumonia, which for the last few years has reached its maximum in April and May, instead of the earlier months of the year. The deaths from zymotics average less than ten in each city. New Haven has proportionately the best showing, reporting only 9 out of 106 deaths.

The deaths from diphtheria in Hartford show a decrease—13—in place of the usual average of 20 that was kept up many months. Were it not for the deaths from diphtheria, the city would present the best record among the monthly death rates. Many towns report little or no pneumonia and the prevalence of a not very severe form of bronchitis. This seems to have been the usual type of the sickness of the month—with some tonsilitis and an occasional case of pneumonia. There has been very little typhoid and not much malaria reported.

ILLINOIS.—Dr. George N. Kreider, of Springfield, has been appointed a member of the State Board of Health, in place of Dr. A. W. H. Reen, of Peoria, resigned.

MICHIGAN.—Reports for the month of May compared with the average for the same month for the preceding six years, shows that intermittent fever, remittent fever, pneumonia and tonsilitis were less prevalent.

For the month of May, 1884, compared with the average for the corresponding month in the preceding six years, 1879–1884, the temperature was slightly lower, the absolute humidity and the day and the night ozone less, and the relative humidity slightly more.

NEW ORLEANS.—At a meeting of the Auxiliary Sanitary Association, May 22d, under the head of general business, the sanitary condition of the city was pretty thoroughly discussed. In reference to the flow of water on Customhouse street from the Louisiana Sugar Refinery, it was the definite opinion of the President, as given to Mr. Halsey on request, that this stream of water is beneficial instead of harmful, and, in fact, is a valuable aid in flushing the city. This flow of water had been turned into the streets instead of into the river at the request of Mr. Elder, Secretary of the Sanitary Association.

On the subject of directing the attention of the City Council to the unfortunate sanitary condition of the city, President Fenner suggested that a communication be addressed to that body tendering them the earnest co-operation of the association.

After considerable discussion on this point, this suggestion was amended by the appointment of a committee of three, consisting of Messrs. Fenner and Elder and Dr. Holland, to pre-

sent the address to the mayor and to confer with him personally.

Dr. Holland stated that a gentleman connected with one of the largest business interests of this country, while on a recent visit to this city, desired to make thorough examination of its worse portions after having been shown its most favored. To that end a cabman of twenty-five years' experience, who guaranteed to show them all they might wish to see, and his turnout, were engaged. The reverend gentleman then, in his peculiarly earnest manner, related to the association the experiences of his trip through Burgundy, Franklin, Liberty and North Robertson streets, where blocks of garbage reeking with the odor of dead chickens and cats, which offended both the nostrils and the eye; thence through St. Louis, North Galvez and North Roman. Never before had he seen such evidences of filth in any civilized city, not even in Cairo nor in Constantinople. They next visited Clio street, from Villere to Claiborne, the dumping ground—the climax of the whole. Hereafter when he should refer to the degradations of sin he could say they stank in the nostrils like Clio street. He did not believe there was another city on the globe where such sights would be permitted, and he could not understand how any municipal government, no matter of what party, could tacitly allow the citizens of the city to be murdered through negligence and ignorance. The Doctor's remarks were warmly applauded.

Considerable time was taken up in discussing the best, if there were any, method of reaching the City Council, so that through them the city can be cleaned. The general impression appeared to be that nothing could be expected except what the Council might think politic in offering the association. The body is well aware of the terrible condition of the city, and there is plenty of money appropriated to keep the city clean, if properly applied. Mayor Guillotte is apparently well disposed towards the association, and they have hopes of arousing his earnest interest in this matter of sanitation.

With the conclusion of the general discussion the association adjourned.

We regret to learn, through the public prints, that under the auspices of the State Board of Health, a quarantine has been

imposed by proclamation of the Governor of Louisiana, on the commerce of the State, similar to that of Texas. Quarantines of mere detention have long since been discountenanced by enlightened sanitarians everywhere. Any vessel in a condition which justifies refusal of *pratique*, is the proper subject of *immediate purification* by direction of the sanitary authorities—no less for her own sake and all persons on board, than for her subsequent relations to other ports and peoples. And boards of health of this day, which do not command the intelligence aud means of purification of infected vessels in a shorter period of time than forty days, are unworthy of the name and of public confidence.

CINCINNATI, O., Seventeenth Annual Report of Board of Health, 1883, C. W. Rowland, Health Officer.—Total number of deaths for the year, exclusive of 410 still births, 5,916 (on an estimated population of 280,000)—21.1 per 1,000. This apparently low mortality in the aggregate is probably due to an overestimate of population. 2,370 of the deaths were of children under five years of age; and of the total number from all causes, 1,363 were caused by zymotic diseases, of which, there were by small-pox, 189; typhoid and typho-malarial fevers, 144; diarrhœal diseases, 323; diphtheria and croup, 140; scarlet fever, 201; whooping-cough, 95; measles, 58. Tubercular diseases are credited with 941 deaths—862 of them from consumption; and besides these, under the head of Respiratory System and Old Age, 907 deaths are summed up, including 190 from bronchitis; hemorrhage of the lungs, 11; hæmoptysis, 2; laryngitis, 12; and from acute lung diseases—congestion, pneumonia and pleurisy—578. These are suggestive figures. They are perhaps to be partially accounted for by the following explanation of the Health Officer:

"On the 19th day of April, the General Assembly passed an act abolishing the Board of Health, and providing for the appointment of a Health Commissioner by the Superior Court of the city. That court declined to act, and consequently there was no Board of Health in Cincinnati, nor any one clothed with the powers of such Board, until the 26th day of July, when the City Council passed an ordinance creating a Board of Health, and your Honors were chosen to compose the present Board. During this hiatus the former Health Officer and some of his assistants ran the office, but were greatly crippled by the lack

of necessary legal authority. The present Health Officer was elected on the first day of August, but not until the middle of that month were his assistants all chosen and all the departments fully at work. This report will therefore exhibit the active work of your Board for only about four and one half months."

The chief unsanitary conditions urged upon the attention of the Board are a vitiated water supply in default of a complete sewerage system, and badly situated water works, filthy streets, alleys and gutters; garbage dumping within the city limits, insufficiently lighted and overcrowded school-rooms.

Births reported during the year, 7,956, as against 7,101 in 1882. Marriages reported to the Board of Health, 1,428, as against 3,265 reported to the Probate Court of Hamilton County—the city embraces the entire county. All clergymen, physicians and midwives are required by law to make returns to the Board of Health. They are admonished to do so. The returns are evidently so incomplete as to be of but little value.

HUDSON COUNTY, N. J., by Annual Report for 1883, had a population of 204,618. The number of deaths was 4,792—714 less than in 1882, and 441 less than in 1881; 23.4 per 1,000. Zymotic diseases were distinguished by the lowest rate yet recorded. Of typhoid fever there was an increase—129 deaths. There has been a gradual increase of this disease since 1880.

Births recorded, 4,238—20.7 per 1,000; the highest rate since 1877. While this record is still far from complete, there is a constant improvement. "The efforts of the State Board to educate public opinion to the point of valuing property of births, deaths and marriages, are no doubt contributing to a better carrying out of the laws regarding their being reported."

Marriages, 2,086—far the largest since the records have been kept, but still deficient.

PATERSON, N. J.—The first report of the Board of Health of this city, covering the period from Nov. 16, 1882, to March 20, 1884, in a pamphlet of 16 pages, is a cogent statement of the condition of the city at the time the board was first organized, and the progress it has made in getting rid of the disgraceful conditions brought to light. Of 7,000 privy vaults in the city, not more than 500 are water-tight; and of the 57,000 population, about 35,000 of them only are supplied by the water com-

pany, the remainder depend upon public and private wells in more or less proximity to the 7,000 privy vaults, leaching their foul contents into the soil from which the drinking water is drawn. Since the work of the board commenced, 1,271 vaults have been cleansed and 1,156 scavenger permits issued for the purpose; 663 nuisances, caused by privy vaults, cesspools and filthy gutters and yards, have been abated. Ordinances have been adopted restricting the privileges of keeping cattle, swine, goats and fowls, and slaughter-houses within the city limits; regulating the removal of night soil and garbage, and requiring premses to be connected with the public sewers, when deemed necessary in the promotion of the public health.

Of diseases: small-pox, scarlatina and diphtheria are the only ones reported upon. Small-pox was one of the very first and most important objects with which the board had to contend. Prior to the organization—from June 10 to November 16, 1882—there had been 139 cases in the city, and at the time the board took charge there were four cases in houses in the city, and 14 in the city hospital. From November 13 to April, 1883, 38 cases were reported. The last case occurred on July 21st, but how many previous to that date since April, is not stated. Of diphtheria, from December, 1882, to March 20, 1884, there were 119 cases and 39 deaths; of scarlatina, during the same period, 580 cases and 78 deaths. Rules for the management of these diseases are appended, together with the general rules of the board, and State laws relating to boards of health. The board has made an excellent beginning, and the field of labor is sufficiently inviting to bespeak for it a telling demonstration of the benefits of an intelligent health service.

DISTRICT OF COLUMBIA.—By report of Smith Townshend, M.D., Health Officer, 1883, the total number of deaths was 4,286, a decrease from the number for 1882, of 285. Of the decedents 2,270 were white and 2,016 colored; the annual death-rates (on an estimated population of 191,980—126,300 white, 65,680 colored) were, for the white, 17.98; for the colored, 30.68: 22.33. Of the total number, 1,669 were children under five years of age; 1,004 were from zymotic diseases, or 23.24 per cent. of the total mortality; the chief of which were: diphtheria and croup, 109; scarlet fever, 125; whooping-cough, 28; diarrhœal diseases, 357; 1,059 were caused by constitutional

diseases, 730 of these being from consumption; less than 17 per cent. were white, and over 25 per cent. colored. 514 were caused by diseases of the respiratory organs, other than consumption, and of these 401 were by pneumonia and bronchitis —164 white, 237 colored.

By a consolidated report of nuisances reported and abated, for twelve years, the number for 1883 (2,232) is less than half as large as for any one of the preceding eleven years, and only about one-fourth as large as for 1877, showing a rare progress of practical sanitation in keeping with the excellent results as measured by the death-rate. But the progressive Health Officer is by no means content. Numerous filthy alleys and premises, unfit for occupancy by reason of house nuisances, defects in surface and house drainage, garbage, offal accumulations, and trades nuisances, still exist in such abundance as to call for prompt action, which he urges upon the authorities. In connection with the subject of offensive trade nuisances—animal refuse rendering, ammonia works, etc., illustrations are given of Dr. Ballard's process for preventing the escape of offensive gases, and of a patent apparatus for destroying them, by O. A. Stevens & E. L. Du Barry. An apparatus to prevent nuisance from asphaltum refining works is also illustrated and commended. These contrivances are worthy of the attention of the sanitary and civil authorities in all our cities.

Births reported for the year, 3,116—1,684 white; 1,430 colored. Of 353 bastards, 300 were colored.

Marriages reported, 607—371 white, 235 colored, and one mixed.

NEW HAVEN, CONN.—The Eleventh Annual Report of the Board of Health, 1883, reports a population of 75,000; deaths dnring the year, exclusive of 71 still births, 1,378: 18.37 per 1,000. 509 were of children under five years of age, and 337 from zymotic diseases. The mortalities in the different wards of the city vary from 12 to 21 per 1,000, and the differences pretty clearly indicate the degree of filth which obtains. The President of the Board, Prof. Brewer, and Dr. Lindsley, the Health Officer, both strenuously urge the importance of completely doing away with the abominable filth pits which are a constant source of disease in the neighborhoods where they are permitted to exist, and an ever-menacing danger to the whole

population as the footholds and places of departure of epidemics.

AUBURN, N. Y.—By report of Registrar of Vital Statistics for 1883, the estimated population of Auburn is 26,000. Number of deaths for the year (exclusive of 44 still births) 399—15.4 per 1,000. 110 were of children under five years of age, and 78 from zymotic diseases. Births reported, 490—exclusive of the still births—18.8 per 1,000. Marriages, 264—10.19 per 1,000.

POPULATIONS AND DEATH RATES.—For the relation of these two factors in computing our tables of vital statistics, we have to rely upon our correspondents—the registrars. Reminders are frequently received suggesting the over-rating of population, and consequent under-rating of the death rate, but we have no means of verifying reports except by census. All we can do is to request of our correspondents, as we most urgently do, not to destroy the value of their reports by over-estimating the population. This should not be made a matter of guess-work, but actual estimate by the most recent official census, and the increase (where there has been a period of years intervening) should be measured by the ratio from one official census to another. The registrar of St. Paul has recently written, claiming 100,000; but we have no sooner published this than another correspondent, who resides hundreds of miles distant from St. Paul, " don't believe it." And another from a city of 100,000, *knows* the city of his residence to have at least 20,000 more than St. Paul. To these correspondents we can only say: give us the facts, if you please—it is the constant purpose of THE SANITARIAN to abide by these if attainable.

DR. C. C. FITE.—At the meeting of the Tennessee State Board of Health, May 29, to appoint a delegate to attend the conference of the Gulf State Boards, at New Orleans, June 2, Dr. Fite, who has been Secretary since October, 1882, resigned his office, the resignation to take effect July 1. Dr. Fite's resignation, on account of the obligations of an increasing private practice, was received with regret by the Board, and expressions of the most cordial appreciation of his faithfulness and efficiency during the whole period of his service, and the best wishes for his future prosperity.

MORTALITY STATISTICS IN THE UNITED STATES.

FOUR WEEKS, ENDING MAY 31, 1884. Correspondents under this head are requested to send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping Cough.	Fevers.	Small Pox.	Diarrhœal Diseases.	Annual rate per 1,000.
Burlington, Vt., 11,364	13	3	2	..	..	..	..	..	..	..	13.7
Boston, Mass., 427,940	803	243	232	39	20	..	13	11	..	24	19.7
*Lowell, Mass., 70,000	96	26	29	2	..	..	..	3	..	4	15.6
Lynn, Mass., 38,284	68	15	16	2	..	..	..	1	..	1	17.5
Somerville, Mass, 28,663	39	12	8	2	..	1	1	..	..	..	14.0
Worcester, Mass., 58,295	110	29	31	7	3		1	1	..	3	19.5
‡Providence, R. I., 120,000	185	38	65	6	6	1	1	4	..	1	18.5
‡New Haven, Ct., 72,000	101	24	27	2	12	..	..	1	..	2	16.1
New York, N. Y., 1,356,958	3151	1190	957	171	76	92	50	63	..	89	24.1
Brooklyn, N. Y., 624,118	891	388	418	39	42	5	20	31	..	22	17.2
†Rochester, N. Y., 101,900	86	24	18	2	..	2	..	2	..	..	14.4
Albany, N. Y., 97,344	247	91	75	12	10	..	12	6	..	1	26.3
‡Auburn, N. Y., 25,000	37	6	12	3	..	..	1	..	..	..	18.2
Yonkers, N. Y., 21,000	26	7	12	1	..	..	..	..	..	..	12.2
West Troy, N. Y., 13,000	27	7	7	3	1	..	1	2	..	1	21.6
Hudson Co., N. J., 209,000	507	164	131	17	12	7	..	19	..	8	25.2
Paterson, N. J., 57,000	..	..	..	..	..	..	..	..	..	..	....
*Philadelphia, Pa., 927,995	1428	446	309	66	58	6	3	58	7	24	16.4
Pittsburgh, Pa., 180,000	358	143	91	21	7	13	4	9	..	..	20.6
‡Erie, Pa., 36,678	36	16	12	3	1	..	..	1	..	..	11.7
*Wilmington, Del., 51,500	80	22	21	2	1	..	..	4	..	6	20.0
†Cincinnati, Ohio, 280,000	255	75	70	..	5	..	..	5	2	5	16.3
*Cleveland, O., 200,429	250	86	52	10	1	1	4	4		..	16.2
‡Toledo, O., 52,000	65	21	24	2	1	1	..	..	..	..	15.0
Detroit, Mich., 140,000	297	147	59	35	6	13	1	1	..	2	23.0
*Evansville, Ind., 40,000	64	30	16	..	..	4	5	5	..	2	22.6
‡Rock Island, Ill., 11,650	3	1	..	..	..	..	..	..	..	..	3.0
Chicago, Ill., 580,000	1190	614	276	79	36	60	11	32	..	61	21.2
St. Louis, Mo., 400,000	540	168	154	30	9	3	3	20	..	12	14.0
Milwaukee, Wis., 145,000	257	132	54	11	5	5	..	4	..	10	18.0
Omaha, Neb., 50,000	..	..	..	..	..	..	..	..	..	..	....
Salt Lake City, Utah, 22,000	38	8	8	..	..	..	..	..	..	..	18.0
San Francisco, Cal., 235,000	495	131	124	10	..	3	4	16	..	23	21.9
‡Minneapolis, Minn., 100,000	121	51	34	16	2	3	3	5	..	2	14.5
‡St. Paul, Minn., 100,000	129	58	25	15	3	5	1	5	..	3	15.4
Baltimore, Md., 408,520	733	299	164	30	16	34	15	31	..	18	18.5
Dist. of Columbia, 194,910	420	138	128	9	43	4	5	10	..	8	21.8
‡Richmond, Va., 73,400	172	35	27	1	..	2	2	34	..	7	28.1
Lynchburg, Va., 20,240	47	15	19	..	..	..	..	2	..	5	48.4
*New Orleans, La., 234,000	642	287	121	5	..	50	4	41	33	52	35.5
‡Nashville, Tenn., 50,000	85	23	20	2	..	1	1	4	3	1	20.4
‡Mobile, Ala., 31,000	87	30	18	..	..	2	..	3	..	6	33.3
§Jacksonville, Fla., 10,000	3	..	..	..	..	..	..	..	..	1	15.6
‡Grand Rapids, Mich., 42,000	37	11	13	1	..	..	..	1	..	..	10.5

* 4 weeks; † 3 weeks; § 1 week; ‡ Month of May.

MORTALITY STATISTICS ABROAD.

FOUR WEEKS, ENDING APRIL 26, 1884.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping Cough.	Typhoid and Typhus Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,019,361	6412	1472	1091	124	95	297	495	68	44	60	21.0
Liverpool. 573,202	1096	258	...	1	7	69	77	18	10	13	29.9
Glasgow, 517,941	1086	226	210	18	17	13	76	13	6	31	25.8
Birmingham, 421,258	708	193	...	5	13	30	18	10	6	6	22.0
§Dublin, 351,014	188	26	45	2	6	..	1	6	..	1	27.9
Manchester, 338,296	715	176	...	2	24	26	24	3	1	9	27.9
Leeds, 327,324	658	149	...	6	42	53	6	8	..	9	26.9
Sheffield, 300,563	494	110	...	1	49	1	10	5	6	2	21.4
Edinburgh, 246,703	424	66	94	3	7	12	37	4	..	10	22.6
§Belfast, 216,622	117	20	33	2	4	..	2	..	..	2	28.1
Bristol, 215,457	290	69	...	2	5	3	13	2	..	1	17.5
Bradford, 209,564	329	90	...	1	..	8	..	7	..	6	20.5
Hull, 181,225	316	73	...	1	..	.	5	3	1	..	19.8
New Castle, 151,325	253	57	...	..	9	1	14	3	7	1	21.8
§Havre, 105,867	54	14	10	3	..	..	..	1	..	2	26.5
*Reims, 93,823	175	34	14	9	..	2	1	..	..	19	31.2
Nancy, 74,954	156	22	19	2	..	1	..	..	..	3	27.0
§Breslau, 290,000	190	62	21	5	2	3	1	3	..	9	34.0
Brussels, 171,293	338	64	40	5	3	1	11	5	17	27	36.0
Cologne, 150,513	293	82	32	..	1	..	10	..	..	10	25 3
†Christiana, 122,000	77	11	12	2	4	..	2	..	..	3	16.1
4 WEEKS, ENDING APRIL 19, 1884.											
Frankfort, 145,100	254	54	39	..	2	4	1	..	..	6	22.7
Hanover, 131,200	220	51	14	14	6	1	6	..	..	..	21.8
Bremen, 119,561	201	63	28	3	4	2	1	..	..	6	21.8
Dantzic, 116,162	230	73	17	11	7	2	2	..	1	10	25.5
Stuttgart, 109,937	202	65	18	6	1	6	2	..	1	13	23.9
*Strassburg, 110,739	191	84	44	4	..	18	2	..	..	23	29.9
Dusseldorf, 105,287	216	51	16	2	..	2	2	3	..	5	26.7
Nuremberg, 105,176	209	64	41	2	1	..	3	1	..	10	26.0
Chemnitz, 102,713	225	98	11	11	1	1	..	..	..	3	28.5
Madgeburg, 105,000	184	53	27	9	1	4	4	4	..	7	22.7
Elberfeld, 101,000	186	53	...	11	14	2	4	1	..	14	23.9
Barmen, 100,000	161	32	12	5	4	..	1	3	..	11	20.9
Altona, 97,000	202	46	16	13	4	2	12	6	..	7	27.0
Aix-la-Chapelle, 89,116	193	61	15	2	..	..	11	3	..	7	28.1
§Mayence, 64,120	26	3	4	1	..	..	..	..	..	..	21.1
†Amsterdam, 350,202	391	..	..	32	7	9	1	2	..	..	28.1
*Rotterdam, 166,001	392	..	..	5	5	14	4	1	..	2	30.5
*The Hague, 131,417	209	..	..	3	..	1	1	3	..	..	27.5
Lyons, 376,613	828	..	176	10	2	4	..	10	44	14	28.4
Berlin, 1,225,065	2264	684	153	263	13	15	33	7	..	126	24.0
Hamburg, 486,678	990	290	120	43	8	7	22	11	..	55	26.4
Dresden, 236,000	441	108	55	116	7	..	9	..	..	10	24.3
Munich, 240,000	616	225	66	16	9	10	11	1	..	72	33.3
Leipsic, 164,636	315	113	32	34	3	..	2	..	..	16	29.7
Kœnigsberg, 154,000	375	119	50	16	23	..	1	4	.	28	29.0
†Bucharest, 200,000	265	78	64	14	5	1	2	8	..	14	34.4
Paris, 2,239,928	4971	676	561	225	12	159	32	149	4	300	28.8
*Calcutta, 433,219	740	..	..	..	..	..	..	186	48	‡115	29.9

* 3 weeks; † 2 weeks; § 1 week; ‡ cholera.

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH ENDING MAY 31, 1884.

	Vessels.	*From*	*Passengers.*	*Deaths.*	*Births.*
May	2, Richmond,	Liverpool,	1,104	1	
"	5, England,	Liverpool,	408		1
"	7, Baltic,	Liverpool,	898	1	
"	7, Devonia,	Glasgow,	752	3	
"	6, Moravia,	Hamburgh,	1,406	3	2
"	9, America,	Bremen,	654	1	
"	9, Pennland,	Antwerp,	894	1	
"	9, Oder,	Bremen,	829	1	
"	11, Lydian Monarch,	London,	309	1	
"	12, Zaandam,	Amsterdam,	847	2	
"	13, Burgundia,	Marseilles,	815	2	
"	14, Scythia,	Liverpool,	760	1	
"	14, Normandie,	Havre,	959	1	1
"	15, Rugia,	Hamburgh,	1,372		1
"	16, Archimede,	Palermo,	398	1	
"	16, Katie,	Stettin,	305	1	1
"	16, Maria,	Bremen,	864		1
"	16, Pennsylvania,	Glasgow,	742		1
"	17, Rhynland,	Antwerp,	759	1	
"	18, Montreal,	Liverpool,	830	1	
"	18, W. A. Scholten,	Rotterdam,	596	2	1
"	20, Hohenzollern,	Bremen,	1,183	2	
"	20, Frisia,	Hamburgh,	939	2	1
"	21, Circassia,	Glasgow,	638	2	
"	23, Noordland,	Antwerp,	890	2	
"	24, Republic,	Liverpool,	890		1
"	24, Donan,	Bremen,	844	1	
"	24, Eider,	Bremen,	1,375	1	2
"	24, Lessing,	Hamburgh,	1,065	2	
"	26, Schiedam,	Amsterdam,	554	5	
"	26, Chicago,	Liverpool,	1,071	1	
"	29, Nevada,	Glasgow,	479	1	1
"	29, Bohemia,	Hamburgh,	1,433	2	
"	29, Belgenland,	Antwerp,	735	1	
"	29, Rhein,	Bremen,	807	1	
"	31, Elysia,	Glasgow,	814	1	
"	31, Elber,	Bremen,	1,140	1	
			31,358	49	14

STATISTICS OF ALCOHOL.

The following tables, published by the Bureau of Statistics, show the consumption of spirits, wines and malt liquors in the United States during the past three years, compared with the same period fifteen years ago:

	Annual average for three years ended June 30, 1878.	Annual average for three years ended June 30, 1883.	Increase per cent.
	Gallons.	Gallons.	
Distilled spirits	57,111,982	73,641,727	28.94
Wines	19,812,675	25,248,233	24.43
Malt liquors	310,653,253	508,077,788	63.55
Total	387,577,910	606,967,738	56.60
Consumption per capita	8.36	11.49	37.44

These figures can be put in a different way, so as to show the relation of consumption in 1883 as compared with the average of the three years ended June 30, 1878:

	Annual average for three years ended June 30, 1878.	Year ended June 30, 1883.	Per cent. increase.
	Gallons.	Gallons.	
Distilled spirits	57,111,982	76,762,063	34.40
Wines	19,812,675	25,885,492	30.65
Malt liquors	310,653,253	555,375,654	77.81

Professor Elliot, of the Treasury Department, estimates the total population in 1883 at 54,163,000. Upon that basis we have a per capita consumption of 10.18 gallons of malt liquors, 1.42 gallons of distilled spirits, and a fraction less than half a gallon of wine.

It is evident that, in spite of temperance societies and all the efforts of the prohibitionists, the consumption of intoxicating liquors has much increased, not only absolutely, but also in proportion to the growth of the population. And, moreover, in proportion therewith the amount of misery and mis-

fortune—insanity, vice and crime—more largely due to intemperance than to all other causes combined. Nor, indeed, is this all. It debases and demoralizes parents, degenerates offspring, lays the foundation for idiocy, insanity and every species of depravity; and it is not too much to say that, of all the causes of premature death, directly or indirectly, alcohol is the most prolific. How to restrict its use is the problem of the hour, which should engage the attention of every thoughtful mind.

ALCOHOL IN GRAIN.—Corn affords 40 pounds of spirits of the specific gravity of .0427, containing 45 per cent. of absolute alcohol for each 100 pounds of grain; wheat, 40 to 45 pounds of spirits; barley, 40; oats, 36; rye, 36 to 42; buckwheat, 40. Now 40 pounds of such spirits equal 3½ gallons of Government proof spirits. It is computed that 1,000 gallons of alcohol are evaporated daily, in New York alone, in the baking of bread. A trial to save the alcohol in one case of testing resulted successfully, so far as securing the alcohol, but the bread was made tasteless by the process.

A NEW TEST FOR PEPTONES.—In the suit of Dr. Carl L. Jensen against one of the parties imitating his well-known Scaly Peptone-Pepsin, of which he is the inventor, Dr. Jensen brought to light that the well known test for bile (Pettenkofer's) is also a test for peptones. The Doctor has long surmised that the slight bitterness of the true peptones is owing to the presence of bile in one of its initial stages, created by the process of digestion; hence his idea of experimenting with the above test, with the result of disclosing the presence of the bilic acids. The Doctor then experimented upon boiled albumen, flesh, and a solution of gelatine after being converted into peptones in separate bottles by one-thousandth part of his pepsin. The albumen-peptone gave a much stronger reaction with the test, than did the peptone from flesh; and the gelatine-peptone was almost unaltered by the test; thus proving that the albumen of the food furnishes the chief elements for the bile.—*Medical World.*

OBITUARY.

SAMUEL D. GROSS, M.D., L.L.D., D.C.L.

This eminent physician, lecturer and author, who has been prominent in the medical world for the last half century, died in Philadelphia May 6th, in the 79th year of his age. He was born near Easton, Pa., and graduated from the Jefferson Medical College of that city in 1828. In 1833 he became a lecturer at the Medical College of Ohio, and in 1840 he accepted the chair of Surgery in the University of Louisville. In 1850 he succeeded Dr. Valentine Mott in a similar position in the University of New York for one year, when, at the earnest solicitation of his former colleagues of the University of Louisville, he returned to that city.

In 1856 he returned to his native State, having been elected to the professorship of Surgery in the Jefferson Medical College, a position which he eminently filled till 1882, when, by the weight of his increasing years, he felt obliged to resign from the laborious duty of teacher, and was appointed professor *emeritus*. Professor Gross, active as a teacher and author for the whole of his professional life. His lectures on the "Elements of Pathological Anatomy," published in Louisville in 1835, at once took a high place as the most complete work on the subject hitherto published in this country. But his "System of Surgery," which first appeared in 1859, is his most elaborate work, and greatest monument to his memory.

Dr. Gross was the recipient of many and deserved honors. Oxford gave him the degree of D.C.L., in 1872; Cambridge, L.L.D., in 1880; University of Edinburgh the same in 1884. Jefferson College and the University of Pennsylvania united in conferring upon him the same distinction, Doctor of Laws, in 1861 and in 1884. He was a member of many, and the most distinguished medical and surgical societies at home and abroad. He was chiefly remarkable during his long life for his unbounded industry. He was a bold operator; the first to sugggest and to perform many great operations, and the inventor of numerous surgical instruments. He never failed to show the courage of his convictions, and crowned his life by an offering to sanitary science—leaving his body to be burned, lest aught of his remains should endanger the living.

LITERARY NOTICES.

THE RELATION OF ANIMAL DISEASES TO THE PUBLIC HEALTH, AND THEIR PREVENTION. By Frank S. Billings, D.V.S., Graduate of the Royal Veterinary Institute of Berlin; Member of the Royal Veterinary Association of the Province of Brandenburg; Honorary Member of the Veterinary Society of Montreal, Canada, etc. New York: D. Appleton & Co.

Prefatorily we are informed, "this book is written for the benefit of the people of the United States." *Why* for them appears by subsequent implication that the people of the United States are particularly ignorant of the subjects treated of, and the physicians unworthy of their confidence. The work is divided into three parts. I. The Diseases of Domestic Animals; II. History of Veterinary Medicine; and III. The Means of Prevention. The first chapter is on *trichiniasis*, with a formidable array of statistics, and an evident purpose prepense, of showing that this disease is chiefly prevalent in the United States. Credit is given to Prof. Leidy for being the first to discover the parasite in the flesh of an "American hog," in 1867, with a mere reference to a knowledge of the disease in Europe, in capsula—the parasite not deing recognized—as long ago as 1821. Its common prevalence in Germany, and the numerous well-marked epidemics in that country, owing to the habit among some of the people of eating ham, sausages, and even pork, uncooked. Within twelve years of the first recognized case (in Dresden, in 1860), eleven local epidemics are recorded; and in one, at Hedersleben, in 1865, out of a population of only 2,000 persons, there were over 300 cases, and 101 deaths. Our author, in his concern to instruct the people of the United States, has wholly omitted to notice these devastations—*not traceable to the American hog*. He recognizes the "one golden rule of prevention: *cook the pork thoroughly*." But he adds, "The ordinary process of cooking, salting, and smoking, are not always a sure means of killing these parasites." Possibly his observation of "the ordinary process" in Germany was limited to mere warming, instead of cooking. There is no evi-

dence that trachinæ have ever survived a temperature sufficient to coagulate albumen—about 150° Fahr.

Tuberculosis of Cattle, and its dangers to mankind from this source—the most important subject in the volume—is disposed of in a dozen pages. But herein is incorporated an aspersion on the honor of the medical profession in the United States so outrageous that we confess to a surprise that the eminent publishers did not cast the whole manuscript into the waste-basket, rather than allow themselves to be made the means of publishing it. The author inquires: "Is it not high time that the principles of scientific breeding should be applied by man to his own species? . . . Have we any right to condemn children thus to lives of misery and early graves? What stock-raisers do for their pockets, mankind should certainly have sense enough to do for their own offspring.

'"Tis through ignorance they do it.'

The blame falls upon the shoulders of an incompetent, avaricious medical profession. Consumptive families bring large fees, help to buy corner lots, and enable the great doctor to ride comfortably about, with coupé and coachman." (p. 62.)

And who is the author of this aspersion—this book? A progressive physician of extensive observation and large experience, who knows practically whereof he writes; one who has labored and is still laboring for the advancement of his profession; a foreigner who has had no opportunity to know better? None of these; but a mere fledgling, a young American, who has pursued his studies and just taken a degree in veterinary medicine in Germany. Seized with an incontrollable *cacœthes scribendi* by the pricking of his pin-feathers, at a single bound he leaps over the heads of all our veterans in medicine—especially those who are identified with colleges—and declares them "nuisances, dangerous to the community . . . producers of unqualified vampires, destined to prey upon an innocent and trusting community." And for this his publishers apologize for him! He is "an enthusiast," they say, who "has given his life and energies to the subject of the establishment of veterinary science in this country; and that the evils so severely combated are not 'straw men.'" Surely the publishers have been imposed upon. The life-work, professionally, of this author is the book before us, and by it it is our duty to

estimate his labors—for we have nothing else. Had he limited his labors to his plan at the outset—to an epitome of the diseases of domestic animals as related to the public health, a sketch of veterinary medicine and the laws by which it is supported and governed in some of the European States, and a summary of the most efficient means for the prevention of epizootic diseases—the work would now be of special service as an aid in carrying into effect the recent acts of Congress for the prevention of those diseases in this country. But just in so far as the author has departed from the work he laid out for himself, and gave way to an unpardonable amount of conceit, he has vitiated all that might otherwise have been valuable, and given just cause of offense to many who would otherwise have promoted his purpose.

THE SENSES—FIVE OR SEVEN, by Dr. William M. McLaury, is an interesting essay read before the N. W. Medical and Surgical Society at its meeting, March 19, 1884, and published by request. Several curious incidents are cited, illustrating knowledge apparently derived by other means than the five senses. But when it is considered how erratic all such independent acquisitions of our minds are, it is clear that they are incapable of any classification as derived from the exercise of a sense on any terms susceptible of classification. *Visions* are, indeed, now what they appear to have always been—mysterious phenomena of the mind, sometimes made singularly clear by subsequent occurrences to those who have had them; and, however much they may appear to some people to be like ghosts and unrealities, their suggestions in some cases are too well authenticated to be successfully disputed. Of such are the illustrations in this pamphlet.

"WOOD'S LIBRARY OF STANDARD MEDICAL AUTHORS," current series, vols. for April and May are:

PRACTICAL MANUAL OF OBSTETRICS. Dr. E. Verrier, Lecturer on Obstetrics in the Faculty of Medicine, Paris. Fourth Edition, enlarged and revised, with the *Four "Obstetric Tables" of Professor Pajot.* 105 illustrations. First American Edition, with revision and annotations by Edward L. Partridge, M.D., Professor of Obstetrics in the New York Post-Graduate Medical School. 8vo, pp. 416.

HOOPER'S PHYSICIAN'S VADE MECUM: A Manual of the Principles and Practice of Physic, with an outline of General Pathology, Therapeutics and Hygiene. Tenth Edition. Revised by William Augustus Grey, M.B. Cantab., F.R.S., Fellow of the Royal College of Physicians; Late Professor of Forensic Medicine and Hygiene, King's College, London, etc.; and John Harley, M.D., Lond., F.L.S., Fellow of the Royal College of Physicians, Honorary Fellow of King's Coll., and Late Physician to the London Fever Hospital, etc. Volume I., illustrated. 8vo, pp. 347. New York: Wm. Wood & Co.

Every subscriber for this excellent series of works has cause for gratification in the production of these volumes. They are both eminently practical, fully up to the time, and brought out in the good style common to the series.

VIVISECTION: In its Scientific, Religious and Moral Aspects, by E. D Girdlestone, B. A. London: Simpkin, Marshall & Co.

A thesis read before the "Clifton Conversation Club," Clifton, Eng., in which the author undertakes to prove that "experimental physiology, restricted and practiced as at present in England, is both justifiable and desirable."

Attention is drawn to certain facts and incidents which seem to indicate that brutes, as a rule, are much less sensible to pain than men, and shows conclusively that both medicine and surgery have profited largely in past times by vivisection.

THE HOSPITAL ASSOCIATION, which was inaugurated in London in February last, is an organization eminently worthy of imitation in New York and other large cities in the United States. It consists of ladies and gentlemen connected with the various branches of hospital administration, and has for its "objects: (1) To facilitate the consideration and discussion of matters connected with hospital management, and, where advisable, to take measures to further the decisions arrived at, and (2) to afford opportunities for the acquisition of a knowledge of hospital administration, both lay and medical." It has the patronage and support of the most distinguished persons connected with the hospitals and other benevolent work in London. The narrative of the origin and foundation of the organization may be obtained by corresponding with the "Office of The Hospitals Association, 1 Adam st., Adelphi, W. C., London. Price, *one shilling*.

SHAKESPEARE AS A PHYSICIAN.—By J. Portman Chesney, M.D., ex-Secretary Medical Society of the State of Missouri; Cor. Member of the Gynæcological Society of Boston; Professor of Gynæcology in Northwestern Medical College, St. Joseph, Mo., etc., etc. 8vo., pp. 226. Illustrated. Price $2.25.—Chicago, Ill.: J. H. Chambers & Co.

This will be a welcome book to all medical readers of Shakespeare who never tire of referring to his application of the physician's art to poetry and the drama. The conception of the author, of collating all the illustrations of Shakespeare's genius in this regard, and so arranging them as to constitute a volume subdivided into chapters on Obstetrics, Psychology, Neurology, Pharmacologia, Etiology, Dermatology, Organology, Chirurgery, and Miscellaneous, is both attractive and felicitous. But we regret that the author considered it necessary to add so much padding; and in some cases, as if with a purpose of showing that he knows a good deal more about medicine than did Shakespeare, which we would have taken for granted, as we have no reason to think he was ever educated to that calling; and right sure are we that if he had been, he would never have had any hand in adding such poor cuts as the publishers of this work have introduced in illustration of his sentiments.—Notwithstanding, the busy physician, when he would rest from his labors, will rarely fail to find in this volume thoughts to soothe his pillow, and incite a keener appreciation of conditions and emotions of the most varied character, always more or less connected with the practice of his profession. The volume is, in short, therapeutics for the doctor; 'twill rarely fail him a remedy for all the caprices he may fall heir to in his endeavor to gain an insight into mental aberrations.

THE MEDICAL DIRECTORY OF PHILADELPHIA for 1884.—Edited by Samuel B. Hoppin, M.D. Philadelphia: P. Blakiston, Son & Co.—This is a very complete directory of all the information likely to be sought by any one in regard to the numerous institutions of Philadelphia in any way related to or connected with the medical profession: Homes, Hospitals, Colleges, Societies, Dispensaries, Reliefs, etc., together with a complete list of *all* the Physicians, Dentists, Veterinarans and Apothecaries, in the city.

THE AMERICAN JOURNAL OF OPHTHALMOLOGY, edited by Adolph Alt, M.D., and published by J. H. Chambers & Co., St. Louis, Mo., of which we have received No. 2., is a new and promising monthly periodical of 32 pages, on a subject which ought to give it substantial support. The editor is well known in the specialty to which the journal is devoted, while he has associated with him nineteen others of high repute as collaborators.—The papers in this number are by Drs. F. Bullen, H. H. Vinke, J. S. Prout, John Green, G. M. Smith, H. W. Herman, S. C. Ayres, B. E. Fryer, and the Editor. Subscription, $2.50 per annum.

MEDICAL REGISTER: NEW YORK, NEW JERSEY AND CONNECTICUT, 1884-'85. Published under the supervision of the N.Y. Medico-Historical Society. William T. White, M.D., editor

This, the twenty-second volume of the REGISTER, contains the names of 6,247 physicians, as follows: New York State List, 2,686; New Jersey State List, 738; Connecticut State List, 496—278 more than were registered last year. The New York City List contains 1,789 names, an increase of 128. The Brooklyn List contains 538 names, 28 more than last year. Since May 1, 1883, 308 of those in the New York City List have changed their residences; 150 are serving in the hospitals and asylums as superintendents or internes, and 31 have died. Forty-four pages are devoted to "Contribution of the Medical History of New York City, from 1784 to 1788." In addition, it contains a large amount of information in relation to medical institutions, societies, asylums, dispensaries, public charities, etc., not elsewhere to be found. It is gotten up in its usual excellent style, and is every way creditable to the editor.

IODOFORM IN DENTAL SURGERY is the subject of an interesting reprint from the *Independent Practitioner*, by C. F. W. Rödecker, D.D.S., M.D.S., New York.

"WHAT AND WHY" is a finely printed and unique little volume upon cycling matters, by Charles E. Pratt, which will interest all wheelmen. It gives hints on what the cycler should wear, and mentions many conveniences conducive to the comfort and pleasure of the wheelman. Boston: Albert A. Pope.

A DOZEN PAPERS RELATING TO DISEASE-PREVENTION, illustrated, by Cornelius B. Fox, M.D., F.R.C.P., London, late Medical Officer of Health, Fellow of the Royal Meteorological Society; author of "Ozone and Antozone," "Sanitary Examinations of Water, Air and Food," "The Disposal of Slopwater of Villages," etc. London: J. & A. Churchill. Price, *two shillings*. A pamphlet of 80 pages, aggregating a dozen circulars and short essays, suggested by the practical work of an observant health officer. Few books of its size contain so much of really valuable suggestion for the prevention of disease.

BRIGHAM HALL, a Hospital for the Insane, Canandaigua, N. Y., Dr. D. R. Burrell, resident physician, reports for the year 1883: total number treated, 100; of whom 33 were discharged, 3 died, 64 remained under treatment at the close of the year. Of 43 admitted during the year, seven were for inebriety, including two addicted to the use of opium. Six were discharged. In what condition (as respects recovery) is not stated. The records show that 118 of this class of patients have been discharged during the operation of this institution, and the superintendent expresses his conviction that the representations of some writers on inebriety—that institutions of this kind are not suited to the successful treatment of inebriates—have no foundation in fact.

STATE ASYLUM FOR INSANE CRIMINALS, Auburn, N. Y., Carlos F. McDonald, M.D., Superintendent, reports for the year ending Sept. 30, 1883:

Total number treated, 178—168 men, 10 women. Daily average, 147⅓. Discharged: recovered, 16; improved, 5; unimproved, 6; not insane, 2; died, 2—total, 31. The percentage of recoveries was 9.98; of deaths, 1.13. The crowded state of the asylum is so great that it has been necessary in several instances to lodge two patients in rooms intended for but one, and to make extra beds on the corridors and floors. Letters from the State Commissioner of Lunacy are appended, attesting the excellent condition of the asylum in all its details.

DEMOREST'S MONTHLY MAGAZINE, which is always alive to give its readers the benefit of the most choice literature, wherever found, in noticing Prof. Hitchcock's paper on "A Perverted Will as a Factor in Insanity," in our May number,

overlooked the inexcusable blunder of a type-setter, who called us "The Sanitari*um*."

"THE URINE IN DISEASE" is the heading of an elaborate chart 24x18 inches, arranged by Louis Lewis, M.D., M.R.C.S., England, and made the supplement to the *Medical World*, Philadelphia. The object is, to show at a glance the abnormal ingredients of the urine in conjunction with the tests in common use for discovering them; the diseases thereby discovered, and therapeutical notes—an enumeration of the remedies indicated. Its utility is apparent, and is alone worth more than the subscription price of the *Medical World* for a year, *with* which it is supplied for *one* dollar.

DETENTION IN ASYLUMS, by Ralph L. Parsons, M.D., of Greenmont-on-the-Hudson, near Sing Sing, is a reprint from the *Journal of Nervous and Medical Diseases*, showing the fallacy of the frequent allegations about the forcible detention of persons in insane asylums, who are not insane, and the importance of asylum restraints to those who are insane; the risks and dangers to the insane and the community, all being on the side of non-restraint, and the too early discharge from asylum treatment.

MEDICAL EDUCATION AND THE REGULATION OF THE PRACTICE OF MEDICINE IN THE UNITED STATES AND CANADA.—Prepared by the Illinois State Board of Health, and published by permission of the Board. 8vo., pp. 308. This is a particularly useful and timely abstract of U. S. Census reports, with important additions as the practical result of inquiries instituted by the State Board of Health of Illinois in its effort to enforce the Act to Regulate the Practice of Medicine in that State. It comprehends the standard of recognition adopted by the Board, under the law to "issue certificates to all who furnish satisfactory proof of having received diplomas or licenses from legally-chartered medical institutions in *good standing*"—such certificates being necessary to the legal practice of medicine in the State of Illinois.

TEA AND COFFEE: Their Physical, Intellectual and Moral Effects on the Human System. By Dr. A. Alcott, with notes and additions by Nelson Sizer. 16mo., pp. 118; paper, price 25 cents. Fowler & Wells, New York.

This is a rather radical book on the injurious effects of tea and coffee, but one which persons addicted to their use in large quantities would do well to read.

THE LAWS OF HEALTH.—Physiology, Hygiene, Stimulants and Narcotics. For Educational Institutions and general Readers. Copiously illustrated. By Joseph C. Hutchison, M.D., LL.D., Author of a Treatise on Physiology and Hygiene; Ex-President N. Y. Pathological Society; Ex-Vice President N. Y. Academy of Medicine; Surgeon Brooklyn City Hospital; Ex-President N. Y. State Medical Society, etc., etc. 12mo. pp. 223.

This is an excellently gotten-up school book—paper, type, and illustrations—and well adapted to the purpose indicated by the author in the preface, for *advanced* students; but it is too much of an epitome of the technicalities of anatomy, physiology and therapeutics for adoption in primary classes.

SCHOOL-HOUSE SANITATION, as reported upon by Dr. J. G. Pinkham, Nathan Clark and O. B. Bruce, a special committee to the School Committee of the city of Lynn, Mass., is a pamphlet of thirty-four pages, with tabulated chart descriptive of all the school-houses of Lynn, showing their unsanitary condition as compared with adduced authorities on the necessary requisites for school-house sanitation generally. It is an excellent presentation of the subject and should be extensively circulated.

TECHNOLOGIC TRAINING IN REFORM SCHOOLS.—An address by William P. Letchworth, Commissioner of the N. Y. State Board of Charities, before the Board of Managers of the Western House of Refuge, Rochester, N. Y., Feb. 26, 1884; also an Exposition of the Views of Prof. J. D. Runkle, of the Massachusetts Institute of Technology, and Martin B. Anderson, LL.D., President of Rochester University. This pamphlet of 48 small pages is so plain that he who runs may read, and get more practical information out of it for the reform of youthful criminals than can be gained from all the truckling legislation to mere political sentiment ever enacted. It is an extension of the system which has been practiced with signal success in the State Reformatory at Elmira, where youths, who are confined for the benefit of society, are turned to good ac-

count for themselves and taught useful trades, by which they can earn an honest living when their terms of confinement have expired.

NOTES ON THE OPIUM HABIT, by Asa P. Meylert, M.D., Member of the Medical Society of County of N. Y.; Member of Harlem Medical Association, etc., etc. Pamphlet, pp. 30. New York: G. P. Putnam's Sons. A paper read before the Harlem Medical Association, Feb. 28, 1884, in advocacy of "more humane methods of treatment than have heretofore prevailed." The author appears to have devoted special attention to the subject, and *his* treatment, which is not very clearly defined, is the purport of his essay.

PUBLICATIONS RECEIVED.—Transactions State Medical Society of Tenn., 1884; Inorganic Chemistry—Kolbe; Annual Report of the Chief Engineer of Water Department, Philadelphia, 1883; Annual Report of the Chief Engineer of Water Department, Boston, 1883.

PIETSCH'S SELF-VENTILATING SEWER-GAS TRAP.

NEW YORK, June 6, 1884.

To the Editor of THHE SANITARIAN: I wish to thank you for calling my attention, through an advertisement in THE SANITARIAN, to Pietsch's Trap. Having been much troubled as a property owner with continuous complaints of sewer-gas escape through all the devices previously at my command, I was alive to anything which promised relief. On seeing Mr. Pietsch's advertisement six months ago, I sent for him, and had one of his traps put on the waste-pipe of a basin which had been very offensive, in the place of a trap which, I had been assured, "would be sure never to siphon." After a few weeks' trial I was so well satisfied with the result that I ordered several others, and wherever I have had them applied they have had the effect of silencing all complaints, and I shall continue so to order, for I do not believe it possible that any gas can escape through it.

Respectfully yours, W. W. THOMPSON.

PENS.—Seven cardinal virtues should be found in a pen. It must be elastic, well-tempered, durable, even-pointed, easy writing, well shaped, and neatly finished. Esterbrook's have all these qualities in perfection.

THE SANITARIAN.

AUGUST, 1884.

NUMBER 177.

SEWERAGE.

AN article in the July number of THE SANITARIAN contains the substance of a paper by Dr. B. W. Richardson, F.R.S., read before the Society of Arts, and published in the journal of that society, wherein he takes the ground, that until the combined system of sewerage is abolished there can be no real advance in physical purification. I quote from the paper as follows:

"Next to the most scientific system of cesspoolage, I cannot conceive any next worse plan than the plan of passing the sewage with storm-water, even on the most scientific system, into running streams; . . . and this society can never be soundly assisting sanitation, until it assists none other mode for removal of excreta than the separate system." He adds: "I know quite well . . . that there are centres of population *in which the separate plan in its rigid application is not suitable.*" The italics are ours.

If the learned doctor had stopped here, there would have been small ground for criticism perhaps, as we freely admit that neither of the two methods are of universal applicability, but that each has its particular sphere, circumscribed in some cases, but within which, if properly carried out, each may be peculiarly applicable, and the best results be anticipated from its introduction; but he goes on to say that he has

"asked and sought many times, for so much as one instance in which the combined system—apart altogether from its loss and extravagance, which might be tolerated if its results were good—has proved a sanitary success. I cannot find one instance of the kind." Here we are constrained to join issue with the doctor, and cannot but think that his knowledge of the method which he condemns has been confined to localities where old and antiquated forms have been patched up to suit a new purpose, resulting undoubtedly in a *combined* system, and that he never visited a city where its sewerage had been designed and carried out, from the first step to the last, in a systematic application of the true principles of the combined method of sewering.

As a preliminary to what we have to offer, we would remark that the distinction should be observed (which is too frequently lost sight of) between the meaning of the respective terms *draining* and *sewering*. By the first process, it may happen that *foul* waters are conveyed from the surface or subsoil, though it is but incidentally that they are so; while sewering consists in removing the excreta and foul wastes of all kinds, with such liquids as are peculiar to them, and which together constitute what we call *sewage*. Hence the draining and the sewering of a locality *may* be two distinct operations, and when so recognized, and the material conducted by, or through, separate channels to their outlets, it constitutes what is known as the separate method; * where, on the contrary, both processes, that is to say both sewering and draining, are performed by means of one and the same subterranean channel, it is what is known as the combined method. Thus, when it is stated that a locality is sewered on the combined method, it means that it is both sewered *and* drained. When by the separate method, it is to be understood as sewered only; it may or may not be drained at all. For instance, Memphis is sewered by the separate method, but cannot be considered by any means as drained. When the merits of the two methods are discussed, in view either of their comparative economy in first cost or efficiency, this should be borne in mind.

* There are properly but three distinct systems of sewering, viz., the dry, the water-carriage, and the pneumatic. The combined and separate are but method of the water-carriage system.

In the early history of communities, so long as the dwellings, whether tents, huts, or houses, were measurably detached, or if in groups, widely scattered, and in the neighborhood of bodies of water at a lower level, as is usually the case, no appreciable danger was to be apprehended by neglecting to provide special means, either for drainage or sewerage. It was not, however, from complete ignorance by all classes of the effects of such neglect of sewering where the surroundings were unfavorable, that little was attempted in this direction, so much as a lack of general information among those to whom what was regarded as a domestic matter was left. We find that Moses, who, we are told, "was learned in all the wisdom of the Egyptians," did not think it beneath him to give special directions to govern his people, when assembled in encampments, as to the disposal of human excreta (Deut. xxiii.); and nature points to the same end in the habits of some animals, notably that of the domestic cat.

When assembled in permanent and condensed settlements, we find that proper drainage came to be regarded as of the more consequence; and the remains of extensive works of drainage, still existing in the older cities, attest the importance, which even in that early age was attached to a dry subsoil for human habitations. Vitrurius, a writer in the time of Augustus, lays great stress upon the importance of properly draining even the comparatively temporary camps of the Roman legions, and urges attention to it as a matter of the first necessity. It is a remarkable fact that, while the neglect of adequate sewerage works, which would be immediately cognizable to more than one of the senses, was measurably disregarded, such great stress should have been laid upon the danger attending bad drainage, and extensive provisions made to meet it, by the public authorities. This, it is true, may have partly arisen from the palpable injury occasioned by freshet waters, but the writings of Vitrurius are in evidence that something more than this was meant and regarded as an evil to be avoided at some trouble and expense. However that may be, the fact remains. The Cloaca Maximum, still in operation in Rome, nearly twenty centuries after its construction, was for the drainage of the city solely, not a particle of sewage being cast into it, although sewers were then in use,

as were water-closets, as shown by existing remains and the writings of the day. The Emperor Heliogabulus, we learn, was murdered in one (*latrinea*), and his body thrown into a small sewer (*cloacula*),* and a class of workmen were known to whom their cleansing was entrusted. Human sewage was partially collected in cesspools, as in Paris at the present time, and presumably the *nose* of their proprietors was trusted then, as now, to warn of the proper time for emptying them. Ancient Rome, with her copious water supply, was comparatively a clean city, and some degree of attention was paid to the matter of the public health, which was entirely neglected in the centuries after her fall, and in the troublous times which followed.

Unlike our modern towns, which run into the country by insensible gradations, the settlements, for purposes of defence, were either enclosed by walls, or the high dwellings were compactly clustered on narrow streets, as we now see them in some of the mediæval cities of Europe, the boundary between town and country being sharply defined. The towns in many cases were drained by subterranean channels leading to some water-course, and built at public expense. So much, we have reason to believe, they understood of the value of drainage; and if a Roman colony, they possibly inherited a public water-supply, otherwise not. The sewerage was regarded as a private matter, and left to the sense of decency, or what passed for it, of the individual house proprietors themselves; it was usually cast into pits, very frequently under the dwellings and all parts of the premises; and the streets even were freely used for such purposes, as they still continue to be in many places. The accumulation of filth was frightful; the poisoning of the soil being the result of centuries of neglect. The disposal of human excreta in and around castles or localities liable to siege was in some cases quite curious, and the entire population grew up in utter ignorance of what constituted personal cleanliness or decency; and yet, as before remarked, *drains* are found in all directions; and at the present day in England extensive works of that kind are occasionally unearthed, which were built by the Roman occupants of the country, but used chiefly by them, as by their successors, for drainage alone.

* Fosse d'aisances, Latrine et vidages. Paris, 1875.

The visitations of pestilence of various kinds, including the plague or black death, imported into Europe from the East, it is believed, in the fourteenth century, ravaged periodically the cities and such localities as were marked even at that day for filthiness of the surroundings, and could not but point to a possible cause in the habits of the people; and the great fire in London happening after the visitation of the plague of 1665 gave an opportunity for widening the streets and opening the crowded areas of that city. This proved a step in the right direction, and the effort was made with some success to compel the use of fixed localities for the storage of human excreta and its final disposal under some sort of regulations.

Instead of the open pit, scattered indiscriminately, masonry cesspools were substituted as the proper thing, and this opinion was confirmed by the improvement in local health which seemed to follow their general introduction. Street sewers or drains were sometimes adopted with distinct outfalls, but under little or no system further than to make them large enough to admit of the entrance of workmen to remove their contents by hand.

The idea of the necessity for the prompt automatic removal of human sewage from the immediate vicinity of dwellings was of very slow growth, however, as too great an innovation upon long-established custom; and, indeed, until the year 1815, we are told, it was a penal offence to cast sewage into any of the underground water-courses, called sewers or drains, which traversed London in many directions.

While no further visitation of pestilence such as that of 1665 occurred in London, when the deaths reached some 75,000, yet at times great mortality prevailed; the death-rate reaching as high as 80 per 1,000 in the latter half of the seventeenth century, and as high as 50 per 1,000 a century later.

Medical men were not slow in appreciating the source of this mortality, and in their efforts to awaken public men to the importance of governmental action in the premises; but we believe the first commission appointed by Parliament to investigate the subject was as late as 1844 (Health of Towns Commission), and shortly afterward it was made compulsory to direct the house sewage into the existing underground drains. This was a great step, and the combined method of

sewering was thus established; not as a system devised *ab initio*, but under the urgent necessities of the case, availing of the readiest means at hand which offered for the removal of sewage.

The drains were large, rough, and in many cases irregular in section and grade, and accumulated the filth which they were expected to carry off; and while some urged that they were not large enough for both purposes, others contended that they were too large. The first report of the Metropolitan Sanitary Commission in London appeared in 1847; and while not advocating exclusively the use of small pipes, pointed out the necessity of reducing the enormous dimensions of the drains then exclusively in use, and altering their shapes. The General Board of Health Report, under the Public Health Act in 1852, advocated strongly the introduction of smaller pipes, and cited numerous experiments and experiences showing conclusively that pipes of a few inches in diameter were amply sufficient for the *house sewage* alone of blocks on blocks of dwellings, and claimed that by reducing the sizes of the pipes *they became self-cleansing and at greatly reduced cost.* Here we have the birth of the separate method, though not so characterized at that date.

I have, at the risk of being tedious, thus very briefly sketched the attendant facts connected with the early and continued recognition of the importance of subsoil and surface *draining*, and the steps which led to the two rival methods of sewering by means of the water-carriage system, which illustrates, what will be found to be the fact, that the separate method of sewering is no novelty (and therefore presumably an improvement upon older forms), but, on the contrary, it is nearly coeval in date (1851) with the combined, and its presumed merits have not lacked advocates and appeals to experiences on a small scale in existing works for the last thirty years. It owes its present prominence before the public in this country solely to the fact that an American practitioner, having patented certain minor appendages, which he is pleased to consider as important to its efficiency, together with the complete exclusion of all rain-water (which is no novelty), has had the address to cause his name to be coupled with the introduction of the method into this country, at the right time and place, and appealing as it

does most forcibly to the principle of economy in first cost, its partial success has been heralded abroad in localities where the cesspool method has prevailed from time immemorial, and where almost any other method which recognizes the water-carriage in its essential features, would, if properly carried out, have worked equal, if not greater, radical improvements. The presumed acceptance of the method even on trial, and on however limited a scale, in the older countries is reflected back, and is accepted here as an evidence of American genius and enterprise in a new field. This patentee is far too shrewd to himself lay claim to the invention of this method, but his lieutenants, with less knowledge of the facts in the case, at all events with less discretion, claim it as an era in sanitation! and the method called by his name is raised to the dignity of a system.

That it is suitable in some localities is shown in Memphis, where the cesspools previously abounding are now banished, and the pressing emergency, which called for something, coupled with the financial conditions which forbade anything more thorough being undertaken, led to its adoption as that or nothing. But the measure of its success in Memphis has been by no means what its advocates had claimed for it, as the published death-rates in THE SANITARIAN before and since will attest. Its claim to universal applicability is as unfounded as that of being a modern invention. Space will not permit at this time a comparison in detail of the respective merits of the combined and separate methods of sewering, or the conditions under which either is the preferable mode, or a combination of both desirable. The reader is referred for this to a paper by one of the first sanitary engineers of our country, Mr. Rudolph Hering, published in the supplement to the National Board of Health Report, No. 16, Washington, December 24, 1881. Mr. Hering, as an entirely unprejudiced engineer, visited Europe under the auspices of this Health Board, and spent a year in the examination of all the known methods of sewering as practised in the cities of Europe, and his report is completely exhaustive of the subject, and as such is recommended to the careful study of all sanitarians who are disposed to consider any one method as pre-eminently superior to all others—in all places.

Dr. Richardson when he advocates the separate method as a point to be made by the Society of Arts, undoubtedly refers

to the English practice, which admits into the pipes the rain water from roofs and yards, but excludes that from the streets and open spaces; whereas at Memphis, great stress is laid upon the entire exclusion of rain water from any source whatever, and there being no existing street drains the street filth finds lodgment in the subsoil. The opinions of engineers based upon large experience is unmistakably in support of the English mode, wherever it is considered expedient to confine the house sewage to a separate line of smaller pipe, and relegate the surface drainage to the old street sewers; where these do not exist, they propose to build them; but in no city, properly such, is it proposed to carry all the drainage in open gutters to the water-courses. It is well recognized there, that street filth is sewage, and must be dealt with as such, and custom, if nothing better, points to the removal of storm-water as little less important than the removal of house sewage.

In a later report, Mr. Hering takes occasion to say, "that the best system in Europe and the cleanest he saw, happened to be of the combined class, and in the cities where they were properly designed, the death rate was less than before their introduction." Dr. Richardson properly lays stress upon the necessity of the prompt removal of house sewage and gives the impression that this can only be secured through the adoption of the separate mode of treatment, whereas the combined method equally recognizes this necessity, and provides ample means for insuring it, and if it be not insured, the method is not in fault, but the mode of construction is faulty. Flushing the branch sewers at their heads, which is relied upon for keeping them clean, is not confined to the separate method, but is equally applicable to the combined, equally efficient, and is recommended in all cases where necessary.

Dr. Richardson's remark quoted above, to the effect that, so far as he was able to ascertain, no combined sewerage works have ever proved successful in a *sanitary* point of view, must be our apology for extending this article to take in the experience of a neighboring city.

Brooklyn, L. I., has an area of 20.8 square miles, on a cluster of hills of moderate height, drained originally by four or five sluggish creeks, bordered by some 2,000 acres of marsh;

its western limit for some nine miles being the shore line of the East River, an arm of the harbor or bay of New York.

The city was laid out without much regard to the directions of the valleys, and in 1856 contained some 200,000 inhabitants, without other sewerage conveniences than cesspools and privy-vaults. On the introduction of a copious water-supply, a systematic plan of sewerage on the combined method was matured, and has been carried out as the city increased in population. There are nineteen main outfalls, and at the present time 360 miles of sewers, ranging in dimensions from a diameter of twelve inches to nearly as many feet; about 70 per cent. of them are pipe sewers, the remainder of brick, about thirteen feet below the street level. All are provided at intervals of one hundred feet with manholes, some of the iron covers to which are perforated for ventilation, and it is intended that all shall be.

The rapid progress of house building, paving, etc., in progress, encumbers the streets with refuse, which is swept by storms into the catch basins at the corners, from whence it is taken out by hand, and carted off. No systematic method of flushing the sewers has yet been introduced, but it is entirely feasible to do so; thus far, however, the waste water, estimated at sixty gallons per head of the population, now slightly over 600,000, has, in conjunction with the rainfall, generally sufficed to keep the sewers clean; and while there are obvious defects both in the construction and management of these sewers, it is undeniable that the system has proved eminently successful *in a sanitary point of view.* There are many skilful physicians in the place, but the death-rate has steadily declined, and is stated in the July SANITARIAN as 17.2 per 1,000, less than one-half of the published rate of Memphis.

The general plan of the system of sewers was to provide for draining the site of the city of all storm-water to the extent of one inch of rainfall in the hour, irrespective of the extent of existing or prospective population; as the latter increased, the dwellings were connected with the street sewers, and the vaults and cesspools abolished.

A mistake was made in attempting to drain by gravity alone below high tide—the consequence being that in times of heavy storms, usually coincident with high tide, the low

outfalls are closed, the rise of ordinary tides being 4½ feet, and the water is backed up the sewers, no provision being made to prevent it; and in flat and low-lying districts not only are the cellars in these localities liable to be flooded, but the foul air of the sewers is forced into the houses. This admits of remedy to some extent. Notwithstanding the dimensions of the sewers, some of them are gorged in heavy storms, to remedy which a system of storm-sewers is being projected for their relief. The sewers were not calculated to take off *all* storm-waters, nor can they anywhere in this climate be so proportioned with propriety. The sanitary value of draining the city to the extent they now do has been well established. Had the separate method been accepted, besides its incapacity for efficient extension as the population increased, the same outlay would have been necessary for the drainage of the city as now, in addition to the cost of the sewers required for the house sewage, not to mention other complications which would speedily arise in a great and growing city. If then a single line of conduits can be made to serve both purposes, that is to say, sewerage and drainage, as experience shows that it can, it is clearly a measure of economy in cost, maintenance, and management, to adopt it—certainly in large cities near the sea.

If the city were going into the manufacture of portable manure the case might be different, for the sole benefit that by any possibility can be anticipated for the separation of drainage and sewerage, lies in that direction; but so long as the Chinca islands furnish guano, or the phosphates so cheaply procured, there will be little demand for poudrette manufactured from city sewage. Sewage is neither lost nor wasted by being cast into the sea; we may safely count upon nature's laboratory for making a proper use of it, while the benefits of being freed from further care of it after it reaches the street sewers, is a positive good not to be rated by dollars.

JULIUS W. ADAMS.

NEW YORK, August 10, 1884.

PREVENTION AND RESTRICTION OF CHOLERA.

[ON the announcement of the outbreak of cholera at Toulon, June 22d, and ever since, the executive officers of the State Boards of Health, and of numerous local boards throughout the United States, have been active in the dissemination of circulars, admonishing the civil authorities to the exercise of measures calculated to prevent the introduction of the disease into this country. We have selected the following, by Dr. H. B. Baker, Secretary of the State Board of Health of Michigan, and the appended abstract from the circulars by Dr. John H. Rauch, Secretary of the State Board of Health of Illinois, as embodying in the largest degree measures which should continue to be pressed upon the attention of all intelligent people; which admonitions, though cholera may lose its present threatening attitude toward this country, will amply repay for their exercise in the prevention of other diseases.—EDITOR.]

The increase of cholera in certain parts of Europe, the probability that it may be brought to the larger cities of this country, and spread from them, or that by some traveller, immigrant, or returning tourist it may be brought to almost any town in this State, even before it appears on the seaboard,* make timely the publication of what seem to be the best means of preventing and restricting the disease.

Asiatic cholera is not caused by anything ordinarily in this

* In 1873 something like this occurred. Three distinct outbreaks of cholera in widely remote parts of the United States were traced to the unpacking of personal effects of immigrants who had come to New York City on uninfected vessels, exciting no suspicion there that they carried the infection of cholera. Within thirty-six hours after they unpacked their effects the first cases of the disease occurred. This was at Carthage, O.; Crow River, Minn.; and Yankton, Dak. Small-pox was recently brought into Wisconsin by German immigrants, who came on steamer Salier, landing at Baltimore May 15th, reaching Black Creek, Wis., May 19th, and taken sick May 21, 1884. Small-pox has also just been introduced into Shelby County, Iowa, in a similar manner, by immigrants who came through Baltimore. Small-pox was recently brought to Le Roy, Mich., by an immigrant who left Bremen, on steamer Weser, May 22d, landed at New York June 4th, reached Le Roy June 9th, and was taken sick June 8, 1884.

State or country, therefore efforts for its prevention or restriction should be directed especially toward the prevention of the introduction of that invisible cause of the disease which is produced in and spread by each infected person; and in case the disease shall reach your locality, to the restriction and destruction of that cause with the greatest possible haste and thoroughness. Even now, by a cleaning up of filthy places, most communities can be put in better condition to control and destroy the infection of cholera, should it be introduced. But when cholera appears something must be done besides cleaning up.

WHO WILL KEEP IT OUT OF YOUR JURISDICTION?

By reason of the tide of immigration this country is especially liable to the introduction of communicable diseases; and by reason of its exceedingly imperfect support of the National Board of Health, the National Government supplies little or no protection to the public health by means of any system of notification, inspection, disinfection, etc., such as the National Board of Health might be enabled to supply; and, inasmuch, as all quarantine powers in this State are vested in the local boards of health, it behooves local boards of health to be prompt to act and to continue persistent in action, so far as it is possible, for the prevention of the introduction of cholera.* So little can be hoped for, however, from irregular local quarantines that every board of health should also be prepared to restrict the disease. Newly arrived immigrants should be under the surveillance of your health officer.

CAUSE OF THE DISEASE.

Recent microscopical and experimental researches in Egypt and Calcutta, made at the expense of the German government, by Dr. Robert Koch, one of the most successful detectives of

* Sections 1708 to 1712 inclusive, and section 1695 of the Compiled Laws of Michigan, 1871, give local boards of health authority, in certain manner, to inspect and restrain travellers, remove infected persons, and take possession of and disinfect baggage, premises, and to make regulations respecting articles capable of conveying infection. Sections 1706 and 1707 require the board of health to "make effectual provision" for the safety of the inhabitants whenever a disease which endangers the public health shall occur within its jurisdiction.

disease-causing germs, seem to demonstrate, what general observation of the disease had already indicated, that Asiatic cholera is caused by the growth and reproduction in the body of innumerable bacilli or one-celled plants of a kind peculiar to this disease, invisible to the naked eye; that these bacilli may enter the body by the air inhaled, but are far more likely to enter by food or drink taken into the stomach; that they are present in the excreta of a person sick with cholera, and in his clothing soiled thereby, and may be on almost everything that comes in contact with his body.

The investigations by Dr. Koch show that the bacillus of cholera can live and reproduce its kind indefinitely in certain, but not in all substances outside the body, namely, in certain alkaline but not in acid solutions; and as the normal condition of the stomach is acid, that it cannot live in the human stomach in its normal condition. The intestinal juices being normally alkaline, the bacillus can, probably, reproduce itself therein without limit whenever it can pass through the stomach. This makes it of especial importance that in times of danger from cholera, the stomach should be kept in its naturally good condition.

Because of the possibility that the cholera bacillus may find lodgment and multiply in various kinds of moist filth, it is important that everything about the house, cellars, barns, premises, alleys, and streets, should be cleaned up and kept dry, and as clean as possible, and that there should be a general disinfection of all places liable to become infected. Especially should privy-vaults, sewers, cess-pools, drains, and similar places, be thoroughly and often disinfected with a strong solution of copperas, which may be made acid by the addition of sulphuric acid. The cholera bacilli are said to thrive in nutritive alkaline solutions, and the contents of most privy-vaults are alkaline; hence the importance of such thorough and frequent disinfection as shall kill any of the germs which may find lodgment there.

RESTRICTION OF CHOLERA.

One of the chief means of restricting cholera is to disinfect immediately and thoroughly all the discharges from those sick with cholera, or with the premonitory diarrhœa, and to dis-

infect or burn at once completely all their cast-off clothing, bedding, etc.

The fecal discharges are not as infectious when first voided as they soon become, hence the importance of immediate disinfection. Thrown without disinfection into a privy-vault, cess-pool, or sewer, the fluids vomited, and especially the discharges from the bowels of a cholera patient may soon infect all its contents, and render it a source of infection to those who approach.*

All the discharges from the body—the vomit, the discharges from the bowels, etc., should be received into vessels containing some concentrated disinfectant, such as chloride of zinc, copperas, or sulphate of zinc, to which may be added sulphuric or other mineral acid.

Clothing soiled by a cholera patient, if laid aside and allowed to remain moist, soon becomes especially dangerous. It is, therefore, important that all such articles be immediately burned or placed in a strong disinfecting solution until such time as they can be burned, or boiled, washed, and dried. (Dr. Koch's experiments indicate that the bacilli of cholera are destroyed by being thoroughly dried for three hours or more.)

The diarrhœa preceding cholera is frequently painless, and there is, therefore, during the occurrence of cholera, great danger of cholera being spread by the discharges of persons yet able to travel about.† During the first stages of cholera, and especially during the initiatory diarrhœa, prompt medical treatment is important and useful, both for the benefit of the individual and as a means of checkiug the spread of the disease.

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* In 1873, a colored boy went to Columbia, Ky., from Lebanon, Ky., where the county fair had been held, and where cholera was then present. He suffered from diarrhœa, and used a privy which was large and full, but from which no sickness had previously been traced. He was found in a state of collapse, and died in the stable. Nearly every person who entered that privy within a few days thereafter was taken sick with cholera. Farmers who came in from the country and only visited once were stricken with cholera. The privy was disinfected, after which no cases were traced to it.

† "That cholera patients are not dangerous to their attendants has been proved in this epidemic in the Military Hospital, where not a single attendant has suffered from the slightest choleraic diarrhœa."—Port's report to Cholera Commr. for the German Empire, on the Epidemic of 1873-74 in the Garrison of Munich.

It has been a practice in England, and should be the practice everywhere, when a man is found sick with cholera, to learn by inquiry what privies he has visited, and at once send an officer on the back track to disinfect them. For reasons just stated, notice should at once be sent to the board of health of a locality from which a case of cholera has come.

Great care should be had to prevent the contamination of the water-supply by choleraic discharges, as by drainage into wells, springs, or other water-supply, from a privy-vault, sewer, drain, or cemetery. The use of water from a source liable to be infected with cholera excreta should be promptly stopped.

Bodies of those dead from cholera should be wrapped in a cloth wet with a zinc solution, and at once buried, the zinc solution to be made in proportions as follows: water one gallon, sulphate of zinc eight ounces, common salt four ounces.

DISINFECTION OF CLOTHING, ROOMS, ETC.

It is best to burn all articles which have been soiled by a person sick with cholera. In the glowing fire of a large furnace is a good place to burn clothing. Great care should be taken to burn quickly and thoroughly whatever is burned, and not simply warm up and spread the infection.

Articles too valuable to be destroyed should be exposed for one hour to a dry heat of from 240° F. to 250° F., or three hours at a temperature of 150° F., or be treated as follows:

Cotton, linen, flannels, blankets, etc., should be treated with the boiling-hot zinc solution (one-half of the strength of that mentioned in the preceding paragraph), introducing them piece by piece, securing thorough wetting and boiling for at least half an hour. Heavy woollen clothing, silks, stuffed bedcovers, beds, and other articles which cannot be treated with the zinc solution, should be hung in the room during fumigation, pockets being turned inside out, and the whole garment being thoroughly exposed. Afterward they should be hung in the open air, beaten, and shaken. Carpets are best fumigated on the floor, but should afterward be removed to the open air and thoroughly beaten. In no case should the thorough disinfection of clothing, bedding, etc., be omitted.

After a death or recovery from cholera, the room in which there has been a case of cholera, whether fatal or not, should,

with all its contents, be thoroughly disinfected by exposure for several hours to strong fumes of burning sulphur, and then it should for several hours, if possible for days, be exposed to currents of fresh air.

Because of the innumerable ways in which the infection may be scattered about the house and premises where there has been a case of cholera, the entire house and out-buildings, including cellar, wood-shed, and privy, may well be disinfected.

Rooms to be disinfected must be vacated. For a room about ten feet square, at least two pounds of sulphur should be used; for larger rooms, proportionately increased quantities, at the rate of two pounds for each one thousand cubic feet of air-space.

Close the rooms as tight as possible, place the sulphur in iron pans which will not leak, supported upon bricks, or over a sheet of zinc, set the sulphur on fire by hot coals or with the aid of a spoonful of alcohol lighted by a match, be careful not to breathe the fumes of the burning sulphur, and when certain the sulphur is burning well, leave the room, close the door, and allow the room to be closed for twenty-four hours.

Privies, cess-pools, drains, water-closets, sewers, gutters, etc., should be frequently and liberally treated with copperas solution made in the proportion of one and one-half pounds of copperas to one gallon of water.

CARE OF THOSE SICK WITH CHOLERA.

The law (section 1706, Compiled Laws of 1871) requires the local board of health to provide nurses, if necessary. There is no excuse for failure to care for those sick with cholera. They are less dangerous to the community if well cared for than if neglected. A careful nurse will frequently wash the hands in a disinfecting solution, and always avoid taking into his body with his breath, food, or drink, any dust or fluid contaminated with any of the excreta from one sick with cholera. Neither food nor drink should be taken by the nurse while in the room with a person sick with cholera. If there is possibility of the infection of the water, it should be boiled before it is drank. By proper attention to cleanliness, ventilation, disinfection of discharges, and of whatever has been in contact with the sick, and by taking proper care as regards kind of

food, regular eating, rest, and sleep, and especially by guarding against taking the specific cause into the body, with his breath, food, or drink, a person in good health may nurse a cholera patient with a reasonable expectation of escaping the disease.

LEGAL DUTIES—PROMPT NOTICES OF OUTBREAK.

The duty of householders and of physicians to give the local board of health prompt notice of the first and of every case of a disease dangerous to the public health, and of the board of health and the health officer to take prompt measures for the restriction of the disease, have been so fully and so often set forth in circulars from the State Board of Health that they need not be repeated here in connection with so dangerous a disease as is cholera.

H. B. BAKER,
Secretary of State Board of Health of Michigan.

LANSING, MICH., July, 1884.

TO RAILROADS.

It is desired, as one important step in the general sanitary movement already inaugurated, that all railway stations, depôts, and the grounds surrounding the same be put in the best attainable sanitary condition, with especial reference to water-closets and latrines, and to the character of the water-supply for the use of employees and passengers. The same supervision should also be extended to passenger cars in the points specified. Accumulations of stagnant water, or the flow and seepage of foul drainage, in the vicinity of human habitations, are always injurious to health; but during a cholera epidemic, they are especially dangerous. So far as such conditions obtain as the result of embankments or road-beds, they should be remedied as speedily as possible.

The preservation of the public health—whereby, among other things, interruption of travel and traffic may be prevented—is a matter in which common carriers and the general public have a community of interests and duties alike; and to which it usually only needs that attention be directed in order to secure ready and efficient co-operation.

JOHN H. RAUCH,
Secretary of State Board of Health of Illinois.

SPRINGFIELD, ILL., July 17, 1884.

PRACTICAL ADVICE IN VIEW OF THE RAPID SPREAD OF CHOLERA.

PARIS, July 18, 1884.

IN reply to an inquiry, Miss Florence Nightingale, the Crimean heroine, kindly sends the following to the *New York Herald:*

"SIR—I beg to reply to your note asking for 'practical advice in view of the rapid spread of cholera.'

"That our whole experience in India, where cholera is never wholly absent, tends to prove—nay, actually does prove—that cholera is not communicable from person to person.

"That the disease cannot be ascribed to 'somebody else,' that is, that the sick do not manufacture a 'special poison' which causes the disease.

"That cholera is a local disease—an epidemic affecting localities, and there depending on pollution of earth, air, and water and buildings.

"That the isolation of the sick cannot stop the disease, nor quarantine, nor cordons, nor the like. These, indeed, may tend fatally to aggravate the disease, directly and indirectly, by turning away our attention from the only measures which can stop it.

"That the only preventive is to put the earth, air, and water and buildings into a healthy state by scavenging, limewashing, and every kind of sanitary work, and, if cholera does come, to move the people from the places where the disease has broken out and then to cleanse.

"Persons about cholera patients do not 'catch' the disease from the sick any more than cases of poisoning 'infect' others. If a number of persons have been poisoned, say by arsenic put by mistake into food, it is because they have each swallowed the arsenic. It is not because they have taken 'it,' the 'mysterious influence,' of one another.

"In looking sadly at Egypt—Egypt, where cholera did not begin anywhere along the route from India to Europe, but at

Damietta, where no ship and no passenger ever stops, and where the dreadful insanitary condition of the place fully accounts for any outbreak of cholera—in sorrowfully looking at Egypt and at Europe now, one might almost say that it is this doctrine of a special poison emanating from the sick, and which it is thought can be carried in a package, that has (mentally) 'poisoned' us. People will soon believe that you can take cholera by taking a railway ticket. They speak as if the only reason against enforcing quarantine were, not that it is an impossibility and an absurdity to stop disease in this way, but that it is impossible to enforce quarantine. 'If only we could,' they say, 'all would be well.'

"Vigorously enforce sanitary measures, but with judgment —*e.g.*, scavenge, scavenge, scavenge; wash, cleanse, and lime-wash; remove all putrid human refuse from privies and cesspits, and cesspools and dustbins; look to stables and cowsheds and pigsties; look to common lodging-houses and crowded places, dirty houses and yards. 'Set your house in order' in all ways sanitary and hygienic, according to the conditions of the place, and 'all will be well.'

"I beg to send you the best thing that has been written upon the subject—where also what can be said about quarantine is fully stated in the best manner—the lecture by Dr. Cuningham, Sanitary Commissioner with the government of India, on the 'Sanitary Lessons of Indian Epidemics,' at the beginning of the *Medical Times*, which I enclose.

"The real danger to be feared is in blaming somebody else and not our own selves for such an epidemic visitation. As a matter of fact, if the disease attacks our neighbors we ourselves are already liable to it. To trust for protection to stopping intercourse would be just as rational as to try to sweep back an incoming flood instead of getting out of its way.

"With the most earnest wish that America, as well as England, may 'set her house in order,' and so defy cholera and turn its appearance elsewhere into a blessing, pray, believe me

"Ever her and your faithful servant,

"FLORENCE NIGHTINGALE."

ILLINOIS STATE BOARD OF HEALTH.

REPORT OF PROCEEDINGS AT THE QUARTERLY MEETING, JULY 2 AND 3, 1884.

THE regular quarterly meeting of the Illinois State Board of Health was held in its rooms in the Capitol Building at Springfield, Wednesday and Thursday, July 2d and 3d.

Present at the Wednesday afternoon session: Drs. Haskell, McKenzie, Kreider, and Rauch; Dr. Haskell presiding in the absence of the President; and at the evening and Thursday sessions, in addition to the above, Newton Bateman, the President, in the chair. Dr. George N. Kreider, of Springfield, appointed to succeed Mr. Reen, of Peoria, resigned, was presented to the members and took his seat with the Board.

The minutes of the last quarterly meeting, April 17th and 18th, were read and approved, after which the regular order of business was suspended and the Board went into executive session on certain cases of colleges and practitioners under the Medical Practice act.

During the evening session the following quarterly report of the Secretary was presented:

During the quarter ended June 30, 1884, there were received in the Secretary's office 604 communications, letters, papers, etc., exclusive of 197 diplomas submitted for verification, and the affidavits and other papers accompanying applications for certificates in 226 cases. There were sent out, during the same period, 827 letters, postals, circulars, etc., and other communications, and the usual quantity of the Board's publications—reports, registers, preventable-disease circulars, epidemic-disease blanks, forms of ordinances, etc. Two hundred and forty-two packages were received, and 212 sent out by express. Seventy-three telegrams received, and 102 sent.

Certificates entitling to practice medicine and surgery under the Medical Practice act were issued to 170 graduates upon

diplomas of colleges which have complied with the requirements of the Board, entitling them to be classed as in good standing, and to 4 upon length of practice in the State. Under the authority conferred upon the Secretary at the last meeting, 17 applicants for certificates, holding diplomas of colleges which had not fully complied with the Board's requirements, have been notified that they would have to submit to examinations on the branches or subjects omitted by their respective schools. In 9 of these cases the applicants have already been examined and certificates issued; 5 of these were examined in hygiene only; 3 in hygiene and general education, and 1 on all the branches, including general education. Three declined to appear to be examined and have left the State, and the remaining 5 are now awaiting their examination.

THE MEDICAL PRACTICE ACT.

Since the last meeting of the Board Dr. C. Buell Rice, to whom a certificate was refused at the special meeting of January 30th, has been tried and convicted of practising in violation of the Medical Practice act. The facts were admitted by the defence, but the court was asked to dismiss the suit on the ground that it was obligatory on the Board to issue its certificate to the possessor of a genuine diploma of any "legally chartered medical institution in good standing," regardless of the moral or professional status of the individual. This the court declined to do, but found the defendant guilty and assessed a penalty of $50 and costs. Notice of appeal was at once given by the attorneys for the defence, but this was subsequently abandoned. The fine and costs were paid, and this last representative of the "K. & K. Surgeons" has left the State.

While this decision again affirms the right and duty of the State Board of Health to inquire into and determine the status of individual practitioners, a decision by the Supreme Court of the State, rendered May 20th, sustains the right of boards, constituted as is the State Board of Health, to determine the status of a college. Under the Act to Regulate the Practice of Dentistry in Illinois, the Supreme Court refused the petition of a dentist, one Isaac N. Sheppard, for a writ of mandamus to compel the State Board of Dental Examiners to issue him a certificate or license based upon a diploma of the

Indiana Dental College. The Board refused the license on the ground that the college was not a "reputable" institution. It was argued that the law constitutes the Board judges of the standing of a college, and there is no power of review vested in any other body. "If the Board should arbitrarily or unreasonably abuse their discretion, and refuse a license without any reason therefor, there is a remedy for such abuse of discretionary power." But there was no ground for claiming that this was the case in the present instance. The Board, in its judgment, had decided that the curriculum of study and requirements for graduation of the Indiana Dental College were not such as to entitle it to be classed as "a reputable dental college," and there is no power in the law given to any person or body to review and set aside, or confirm, the exercise of this discretion by the Board. The petition for a mandamus was, therefore, denied.

It is also noted in this connection that two colleges which the board has long refused to recognize as in good standing have recently met with signal and final defeat in their efforts to secure a legal rehabilitation. The New York Court of Appeals has affirmed the judgment rendered by the Supreme Court of that State about a year ago, in the case of the United States Medical College of New York, setting aside the charter of that institution. As this appeal was understood to be taken as a test case by the attorneys for the Buffalo College of Physicians and Surgeons, this decision is to be regarded as conclusive on this college also.

There have been fewer complaints made direct to the Board of unprofessional conduct, and fewer cases of this kind otherwise coming under observation during this quarter, than ever before in the history of the Board. J. E. Anderson, of the "American Surgical Institute," in Indianapolis, previously run out of Paxton, Tolono, and elsewhere, was arrested in Freeport, on May 9th, for practising in violation of the law. The case was clearly made out. Anderson pleaded guilty; a fine of fifty dollars and costs was assessed, which he paid, and at once departed for his Indiana home.

Two of the Chicago quacks, arrested for circulating obscene and indecent literature through the mails, have recently been tried in the United States District Court and fined $200

each, with costs. One of these cases was an aggravated one, many of the vile pamphlets having been sent to school-girls at various places. I do not hesitate to pronounce the penalties inflicted in these cases as totally inadequate. Although the stereotype plates and the editions found were understood to have been destroyed, one of these men is already again distributing his nefarious circulars. The only way to suppress these violators of public decency and morals is to imprison them.

MEDICAL EDUCATION.

At the annual meetings of the various medical organizations, State and national, which have been held during the past three months, the subject of the preliminary education of medical students has received more than usual attention. Almost unanimously the individual members of the profession, and these various organizations as units (with one single exception), have pronounced in favor of exacting proof of proper preliminary education before admitting candidates to the lecture classes. There is practically no opposition to the movement, the only dissentients now remaining being a few members of college faculties, influenced probably by a fear of diminished classes. With few exceptions—and these diminishing in number from time to time—the better class of colleges have already adopted this requirement. Every announcement for the session of 1884–85, thus far received, makes this a distinctive feature; but it is to be wished that the colleges would state specifically in their announcements the kind of examinations applicants would be subjected to, or the proof of fitting education required, instead of merely saying, as some of them do, "a preliminary education is required," or making use of some similar vague generality.

As illustrating the wide-spread influence of the effort to heighten the standard of professional acquirements it may be stated that, at a recent meeting of the Nebraska State Medical Society, the qualifications for admission to membership were so amended as to require that applicants must be graduates of colleges which in all respects conform to the standard of minimum requirements of this Board.

PRACTICAL ANATOMY.

In the further interest of medical education I think it is the duty of the Board to exert its influence toward securing legislation for the proper and adequate supply of material for the study of practical anatomy. Colleges in this State have been embarrassed during the past year or two in their efforts to properly instruct their students in this most important branch; and the difficulty is increasing. Surgical knowledge and skill cannot be acquired without an intelligent and practical study of anatomy, and in order to secure this, the methods and sources of the supply of material need to be more definitely recognized and regulated by law.

THE PUBLIC HEALTH.

Scarlet fever and small-pox prevailed to some extent during the first half of the quarter, mainly in the southern portion of the State. Except the few cases in Chicago and those in Kendall County, all the small-pox cases occurred in the south half of the State, but scarlet fever was more generally diffused. Both diseases have been of a mild type, with a moderate death-rate. As the season advanced there has been the usual increase in the diseases of hot weather, but not characterized by any noteworthy features.

SMALL-POX.

Although eight cases of small-pox have been brought into Chicago from other places since January 1, 1884, only one case was contracted from any of these by a resident of the city. Three of the eight cases were Indians, brought in from the Indian reservation; two were from Indianapolis; one from Cincinnati, and two from the town of Cicero—said to have been contracted from a tramp from Ohio. One of the Indianapolis cases reached Chicago four days before the appearance of the disease, and from him resulted the only case which originated in the city—a man with whom he slept one night contracting the disease from him. In no other case was there any spread of the disease; and the methods of dealing with the cases as they appear, the details of disinfection, the general vaccinal protection of the community—especially of the seventy thousand school-children, and the large number of poor peo-

ple—are so thorough and perfect that Chicago, notwithstanding its immense railroad travel and the large number of transients, has been, for many months, one of the safest cities in the Union in this respect.

At the close of the last quarter small-pox existed in Centralia, Marion County; Charleston, Coles County, and Coulterville, Randolph County. Owing to municipal neglect and a mistaken idea of economy, the disease obtained a foothold in Centralia, which it subsequently required great effort to overcome, besides creating alarm and apprehension in neighboring communities. The disease was conveyed from this place to Irvington township, in Washington County; to Belle Rive, in Jefferson County, and to Springfield. The first case in Centralia, it is stated, was treated by Dr. Alexander Jones, whose certificate the Board revoked at the January meeting for unprofessional and dishonorable conduct. It is alleged that Jones treated the case without any of the necessary precautions; not reporting it to the authorities, nor in any manner guarding against spread of the contagion. The patient was treated during the entire illness in a room separated only by a curtain from a shoe shop on one of the most frequented streets of the town, and the shop was daily visited by numbers of persons. It is believed that all the cases in Centralia—thirty-two in number, with six deaths—as well as those in Washington, Jefferson, and Sangamon Counties, are primarily due to the criminal conduct of this man. The Board has exhausted its authority in dealing with him by revoking his certificate, since he claims the exemption of the ten years' prior practice clause of the Medical Practice Act. In charging him, however, with being primarily responsible, it is not meant to exonerate the municipal authorities from all blame, for as early as March 8th, they were duly notified of the existence of a case resulting from this first concealed case.

From the tramp who carried the disease into Charleston, Coles County, as reported at the April meeting, there resulted five other cases, making a total of six cases and three deaths. The first of this last group of cases was a man who visited the tramp, denying that the latter had small-pox; in the usual time he came down with the disease, and died on the thirteenth day.

At Coulterville, Randolph County, also mentioned in my

last report, there were five cases, with one death in the first outbreak, which was caused by a negro roustabout, who had contracted the disease on the river. Notwithstanding a rigorous quarantine and other precautionary measures, some obscure cases of varioloid followed the first outbreak, and through failure to correctly diagnose the early cases of this second group, which were not characteristic, the disease still continues.

The outbreak at Yorkville, Kendall County, was due to a young man recently arrived from New Orleans, who had an unrecognized case of varioloid. A large number of persons were exposed before the facts were known, and a total of nineteen cases, with four deaths, resulted. So much excitement was caused by the first group of these—some fourteen in number, eleven of which appeared in rapid succession between March 27th and April 2d, and in several localities—that I found it necessary to visit the town personally. The published instructions of the Board were thoroughly carried out, a supply of vaccine virus was obtained, and all unprotected persons were at once vaccinated. Notwithstanding the number of the centres of infection, only five more cases resulted—the last being after an interval of fully a month. The speedy suppression of the outbreak, which promised to be very serious at the date of my visit, was due to the prompt and efficient co-operative action of the authorities of the four separate jurisdictions in which the cases appeared.

There have been seven cases of small-pox, with two deaths, among colored steamboat hands at East St. Louis, all contracted on the river. These cases were removed as soon as discovered, from time to time, to the St. Louis Small-pox Hospital; and about the last of May I received a communication from the Health Commissioner of St. Louis stating that the East St. Louis patients were the only ones then in the hospital, and that the institution was kept open solely for the benefit of the latter place. While this is technically true, the relations of the two places are such that what is done for the one, in such a matter as this, is really done for both. However, I again visited East St. Louis and discussed the situation with the authorities, and am glad to be able to state that a Board of Health has since been organized and the burial-permit ordinance prepared by the Board has been adopted.

Isolated cases of the disease have also occurred during the quarter at Mound City, Pulaski County, one case, probably contracted on the river, no spread; at Red Bud, Randolph County, one case, contracted in Cairo, no spread; in Irvington Township, Washington County, two cases, contracted in Centralia, and one from the person of the nurse, who had had the small-pox when young; at Belle Rive, Jefferson County, one case, contracted in Centralia, no spread; in the country, six miles south of Nashville, Washington County, one case, contracted in Coulterville, and from this four more cases in the same family; in Ashmore Township, Coles County, one case, contracted in nursing an unreported case on the county poor-farm—patient had had small-pox when young; and in Springfield, Sangamon County, one case, contracted in Centralia, and not recognized until after death, so that there will probably be other cases from this, although the usual precautions were at once taken when the character of the illness was discovered. At the close of June another group of three cases is reported in East Fork Township, Clinton County, five miles southwest of Patoka, and sixteen miles north of Centralia, where the disease was contracted.

Although the contagion has been repeatedly introduced into Illinois from without during the past winter and spring, we have been fortunate in escaping it by immigrant introduction thus far. Neighboring States have been less favored—Iowa, for example, having now a serious outbreak, upward of twenty cases in one county, all among immigrants landed at Baltimore, from the steamer Salier, of the North German Lloyds line. The want of appropriations whereby the National Board of Health might continue its immigrant inspection services is seriously regretted.

With regard to further action concerning small-pox, in view of the probability of its epidemic spread from abroad, as shown by its increasing prevalence in London and elsewhere, and its frequent introduction into the State from neighboring States, I would suggest that it is desirable to call the attention of sanitary authorities and others to these facts, and to the experience of the last few months, which show that when the disease is introduced into a community where vaccination and revaccination were not thoroughly carried out during the recent epi-

demic, there is still danger of serious trouble. It is also important that county superintendents, school boards, and others interested should have their attention again directed to the fact that the school-vaccination order of the Board is permanent and continuous, and that its thorough enforcement is expected.

THE CHOLERA.

An epidemic spread of Asiatic cholera now seems imminent. What is known as the Damietta outbreak failed to secure a foothold in Europe last year, and with the exception of a few isolated cases in Russia, and one fatal case at the Smyrna lazaretto—all in July of 1883—it is believed that the disease from this outbreak was confined to the delta of the Nile. France, it is true, was threatened by the arrival at Havre of the steamer St. Bernard in June last with one case on board; but preventive measures were successfully instituted on that occasion, and the evil then averted. About May 1, 1883, the British troop-ship Crocodile was reported in quarantine at Portsmouth, England, having then had eight cases of cholera on board, six of which proved fatal; but on this occasion also the disease seems to have been confined to the infected vessel. The French have been less successful in their recent precautionary attempts, if it be true, as is now alleged, that the Toulon outbreak was due to a fatal case on board the transport Montebello from China—the infected clothing of the case not being destroyed. Later advices state that the disease was brought from Egypt in the troop-ship Sarthe. It has already spread to Marseilles, Lyons, the villages above Toulon, and cases are reported in Italy and elsewhere.

Whether the disease will cross the Atlantic from the East will largely depend, of course, upon the efficiency of the measures employed to confine the contagion to its present localities. Very general activity is manifested by all the European Governments and sanitary authorities, and it is to be hoped that they may prove successful, although the dissenting opinions of the English authorities as to quarantine may lead to friction between them and the Continental authorities. Meanwhile, we are threatened not only from Europe, but from the opposite side of the globe—cholera seeming to be spreading in China and to have broken out in Japan.

In view of this condition of affairs I have thought it my duty on behalf of the Board to urge that the organization of the National Board of Health should be maintained, and have advised to that effect, hoping that it may be possible to still secure the necessary appropriation for this purpose in the Sundry Civil Service Bill. Should cholera continue to spread on the Continent it is more than likely to find an entrance into this country, despite the efforts which may be made by local and State authorities to exclude it by quarantine regulations. Want of uniformity, failure to co-operate, commercial considerations, and local conditions all combine to impair the efficiency of any system of quarantine; and to the extent that these obtain, in the absence of a uniform system, is the danger of failure increased. The remedy, of course, is in the national control and administration of quarantine; and the present emergency furnishes another argument for the continuance of the National Board of Health with adequate appropriations and increased power and authority.

As to what should be done by us as a Board in the present aspect of affairs, I would say that my own experience and observation lead to the conclusion that it is not judicious to place entire reliance on quarantine measures, no matter how administered, should the disease become epidemic in countries or ports with which this country has close commercial relations. Asiatic cholera, although it may invade places in good sanitary condition, finds its most congenial habitat where filth in any form abounds. The best attainable sanitary condition—clean streets and premises; the prompt and proper disposal of organic refuse, night-soil, and all forms of sewage; well-ventilated habitations with dry, clean basements; a pure and sufficient water-supply; and good individual hygiene, including personal cleanliness, a proper diet, and regular habits of life—these are the best safeguards against Asiatic cholera, as they are against most diseases. If it should, unfortunately, appear in a locality whose sanitary condition is good, as thus outlined, there is every reason to anticipate its prompt arrest by well-understood measures—thorough isolation of cases, disinfection of discharges, etc. Cholera is pre-eminently a disease to be fought by sanitation.

Professor Koch's recent researches, by which he has de-

monstrated the existence of the cholera bacillus, promise something in the way of special prophylaxis; and in so far as this is in a direction to which a great mass of empirical knowledge points, it may be worth while calling attention to this feature. I allude to the practical point, which Koch has demonstrated, of the development of the comma-bacilli in alkaline moisture, and its arrest or destruction by acids. If further experiments confirm this proposition the preventive treatment of Asiatic cholera may come to be a matter of as much certainty as the prevention of small-pox.

As to our own immediate action in the premises I have to suggest that the attention of sanitary authorities throughout the State be officially called by the Board to the necessity of promptly securing the best attainable sanitary condition of their respective localities. A thorough sanitary organization of the State with the view of improving its general sanitary condition is one of the matters to which the Board may now profitably give its attention. The Board is now, at the end of its first term, in a position to give this subject more consideration than heretofore; and it is entirely possible that such an emergency may present itself as will make this of the first importance.

YELLOW FEVER.

With the exception of recent reports of the reappearance of the disease at Guaymas, Mexico, where it prevailed extensively last year, and of some increase in the number of cases in Havana, there is an encouraging absence of yellow fever indications in the South up to date. A conference of representatives of the boards of health of the Gulf States was held, at the request of the newly-organized Louisiana State Board of Health, in New Orleans, on June 2d, 3d, and 4th, the object of the conference being to bring said boards into harmony and, if possible, to devise and recommend improvements in the systems of quarantine in vogue along the Gulf Coast. Representatives of the General Government, of the Auxiliary Sanitary Association, and of the various commercial organizations of New Orleans, were also present by invitation. The proceedings were characterized by moderation and a gratifying display of mutual confidence and desire for thorough co-operation. Many practical suggestions were made, and, on the

whole, the conference would seem to promise more of benefit than anything of the kind which has occurred of late years in that region, provided the means necessary to put into effect the wishes and intentions of those concerned be forthcoming.

Meanwhile, as already stated at our last meeting, the Sanitary Council is prepared to adopt, if it should become necessary, the same line of action in regard to the prevention of the introduction of yellow fever, or other epidemic diseases, into the Mississippi Valley, as that pursued in 1883.

INFECTIOUS DISEASES OF ANIMALS.

Cases of glanders and other infectious diseases among animals continue to be reported to the Board. On June 28th, Dr. C. N. Cooper, of Batavia, Kane County, reports having a patient under treatment suffering with glanders, and wishes instruction and advice as to his action. The amended Pleuro-Pneumonia and Glanders Act has by no means relieved the Board of responsibility in these cases. The public naturally apply to the health authorities in matters pertaining to health, and thus far the State veterinarian is only reached in a large number of cases through this office. Whether further legislation is necessary on this subject, and what form it would take, are matters which seem to require the consideration of the members.

SANITARY CONFERENCE.

In accordance with the authority given at the last meeting, I attended the conference of representatives of State boards of health, held during the recent session of the American Medical Association in Washington. An organization was effected, officers elected, and plans adopted for securing co-operative action by the various boards in the event of any emergency arising which threatens the sanitary interests of any of the States in common. Meetings will be held during the annual sessions of the American Public Health Association for the interchange of views, and the furthering of the plans and objects of the organization.

THE FIFTH ANNUAL REPORT.

Continued delays in the public printing office have still further postponed the publication of the Fifth Annual Report of

the Board, but a full force of compositors is now at work upon it, and assurance is given of its speedy completion. The material for the Sixth Annual Report is in an advanced state of preparation, and together with the "Revised Official Register of Physicians and Midwives," which is, also, nearly ready, will be put into the printer's hands as soon as the Fifth Annual Report is out of the way.

All of which is respectfully submitted.

JOHN H. RAUCH, *Secretary.*

At the conclusion of the reading of the Secretary's report, which was accepted and ordered placed on file, the following resolutions were adopted, looking to putting into effect the various suggestions embodied in the report:

"*Resolved*, That the importance of the study of practical anatomy as a foundation for surgical knowledge and skill demands that the supply of material for this study be more definitely regulated, and its necessity recognized by law, and that the Illinois State Board of Health respectfully urges the attention of law-makers to these considerations.

"*Resolved*, That the increasing prevalence of small-pox in London and elsewhere, indicating a probable renewal of the epidemic tendency, and its frequent introduction into Illinois from neighboring States within the past few months, make it desirable that vaccinal protection be secured as fully as possible in every portion of the State; and to this end the Secretary is hereby authorized to call the attention of sanitary authorities and others to the subject, and to take the necessary steps to push the further enforcement of the school-vaccination order of the Board, so that all new scholars, and those who have not heretofore fully complied with its provisions, may be properly protected against small-pox before the advent of cold weather.

"*Resolved*, That, while epidemic cholera may be excluded from this country by thoroughly-enforced quarantine regulations, yet the best attainable sanitary condition of every locality in the State should be secured, so that in the event of Asiatic cholera effecting an entrance, notwithstanding quarantine, the disease may be met and fought under the most favorable circumstances. The Secretary is, therefore, hereby au-

thorized to take such action as, in his judgment, will most promptly obtain a thorough sanitary organization of the State, and the adoption and enforcement of the measures necessary to improve its general sanitary condition."

On motion of Dr. Haskell, the Secretary was given discretionary authority to act for the Board in any case of emergency which may arise in the interim between the regular meetings.

During the executive sessions the cases of a number of colleges, with reference to the requirements of the Board and their standing under the Medical Practice Act, the important features of the office correspondence during the quarter, and the cases of a number of practitioners, were considered, and the necessary action was taken in a large number of these. The following certificates were also ordered to be revoked:

Certificate No. 913, issued to Peleg W. Blakeley.

Certificate No. 1,103, issued to Fritz Tripple.

Certificate No. 3,190, issued to Servetus Meyer.

Certificate No. 4,207, issued to William Becker.

After the transaction of sundry routine business, auditing of accounts, etc., which occupied the hours of the morning session, the Board, at 11.30 A.M., adjourned.

WILL BE A POLITICIAN.—A little boy and girl playing in the yard. The girl finds an apple under a tree, and, with an exclamation of delight, begins to bite it.

"Hold on," says the boy. "Throw it away. The colwy is comin', an' if you eat that apple you will be took sick an' you can't talk, an' the doctor will come an' give you some bad med'cine an' then you will die."

The girl throws the apple down, and the boy, snatching it up, begins to eat it.

"Don't," the girl cries. "Won't it kill oo, too?"

"No," said the boy, munching the fruit, "it won't kill boys. It's only after little girls. Boys don't have colwy."

That boy will be a great politician.

THE MISSISSIPPI QUARANTINE AND THE LOUISIANA STATE BOARD OF HEALTH.*

By G. B. THORNTON, M.D., President of the Board of Health of Memphis, and Member of State Board of Health of Tennessee.

IN compliance with a resolution passed at a called meeting of your board, May 20th, I visited New Orleans and participated in the conference, June 2d, called by the Louisiana State Board of Health, May 8th, of "representatives of the State Boards of Health of Florida, Alabama, Mississippi, Texas, and Louisiana, for the purpose of bringing said Boards into harmony, and, if possible, to devise and recommend improvements in the system of quarantine in use along the Gulf coast," etc.

With their present facilities for quarantine the sanitary authorities of the Gulf States do not inspire that confidence abroad which it is to the interest of every Southern port to enjoy. They confessedly have not the ability to cope satisfactorily with this question.

The following extract from the inaugural address of President Holt, of the Louisiana State Board of Health, delivered April 24th, is an admission of this, and at the same time an appeal to his State, which should at once remove all just cause from want of means to establish confidence by having his Board placed upon a footing commensurate with the situation, and enable it to satisfy all just demands upon it. Louisiana owes this to itself as well as to the vast country which is tributary to New Orleans as its commercial mart. "The press and the people have welcomed us most kindly, and have spoken in terms of great consideration, but have not hesitated to tell us: 'This city must be kept healthy. This great work has been imposed upon you, and you are expected to perform it.' These are the figures: In a district of 57,000 people we have two sanitary officers. In the Second District, population

* Abstract of Report of Proceedings of Conference of Representatives of State Boards of Health, held in New Orleans, June 2, 1884, from *Memphis Appeal*.

45,000, are two officers. In the Third, 45,000 people, two officers. In the Fourth District, population 38,000, two officers. In the Sixth and Seventh Districts, population 22,000, scattered over several square miles, is one officer. Pay of officers, $50 per month; annual allowance to Board of Health from city, $6,000; annual allowance to Board of Health from State, a resolution of thanks. But for the scanty and contested pittance gleaned from Quarantine, and the yet smaller mite from the office of the Recorder of Marriages, Births, and Deaths, we would be absolutely penniless. Our city and State are become to us as Egyptian taskmasters: 'Go therefore, now and work, for there shall no straw be given you, yet shall ye deliver the tale of bricks.' . . . . When we undertake to accomplish a $50,000 work with $6,000, and the work of eighty men without horse or cart, this is a responsibility which rests upon the city of New Orleans and the State of Louisiana."

Of all cities in this country, New Orleans requires a health service well equipped in all its appointments, with strict quarantine and local sanitary work. But the quarantine feature is the one we are mostly interested in and now discussing, and not its local sanitation, which is, however, admissible if time and space permitted. The importance of municipal sanitation is one of the subjects suggested in the circular letter of May 12th, and President Holt, in the address above quoted, uses the following significant language to one whose business it is to study the possibilities or probabilities of again acquiring yellow fever from New Orleans: "There are those—and I announce myself as of their number—who hold that it is possible, and experience abundantly justifies the declaration, that yellow fever may be called into activity in New Orleans without recent importation or importation at all, as far as we are able to decide. I have myself seen this disease appear here under circumstances which baffled every effort of attending physicians and boards of health, with their corps of sanitary police, to detect the slightest clew to importation."

It is no idle curiosity or morbid feeling of inquisitiveness that prompts Tennessee to inquire into the sanitary affairs of its Southern neighbors. Memphis is to Tennessee what New Orleans is to Louisania, its commercial city; and between the

two there are constant and intimate commercial relations, both by river and rail, which are annually increasing. Neither the Tennessee State Board nor the Memphis local Board of Health wish to disturb those relations which it is their duty to preserve, as far as the public health is concerned. Especially would they regret this year the necessity for an official act which would excite suspicion against New Orleans when it is preparing for its great Exposition and inviting exhibitors from all parts of the world to place their exhibits there at a period when yellow fever is liable to develop. While I feel this way, and so stated before the conference, I also distinctly stated that, if notified of the existence of one case of yellow fever in New Orleans, the appliances of quarantine would be at once placed in commission, and while everything would be done compatible with official duty to allay public apprehension and preserve intact commercial intercourse, the appliances would be in hand for the enforcement of non-intercourse, if it appeared the preservation of the public health demanded it. In stating this, I felt assured I reflected the sentiment of that portion of Tennessee most interested in the question. I am satisfied the boards of health along the Gulf coast, especially the Louisiana State Board of Health, will do all in their power to preserve the public health and to merit public confidence. In my opinion there is no doubt as to their honesty of purpose and a sincere desire on their part to discharge faithfully and efficiently the duties devolving upon them; but the facilities at their command are not what they should be. The quarantine and disinfecting appliances so graphically described in Dr. Holt's admirable address are not what he has, but what he would have if he could. The plan proposed will, when established, no doubt answer the purposes sought, which is to have a refuge station near the mouth of one of the outlets of the Mississippi River, and require all infected vessels to go there for treatment before they are allowed to approach or have communication with the city. But the proper legislation has yet to be had, and the ways and means provided by the Louisiana Legislature for this new station. In the meantime, I think Ship Island the only available refuge station properly equipped for the treatment of infected vessels. Since this conference was held, at the instance of the Louisiana State Board

of Health, the Governor has issued a proclamation declaring obligatory quarantine of forty days for all vessels from infected or supposed infected ports. The question naturally arises, where are these vessels to be held in quarantine? At the present Mississippi River quarantine station? Long years of experiment have proven this to be an unsafe place for infected vessels and their cargoes to be disinfected, assuming, of course, that the authorities in charge of this station did their duty. Yellow fever has repeatedly passed through this station, or, at least, gotten into New Orleans—whether through this, the Rigolets, Atchafalaya, or some other route, it is immaterial, the authorities were equally responsible. It is also immaterial to us whether the fault is with one or all the quarantine stations or with the administration. The fact exists that yellow fever infection has been repeatedly allowed to get into the city, and whenever it is we are in danger.

Without, I trust, being considered inquisitorial, I will state in this connection that some enlightened bodies of Louisiana are apparently dissatisfied with the present methods of administration of their sanitary laws, and the following quotations, while throwing some light on the subject, are not calculated to inspire confidence in other communities outside of the State interested in these affairs: A "petition in behalf of State Medicine to the General Assembly of the State of Louisiana, by the Louisiana State Medical Society, Orleans Parish Medical Society, New Orleans Medical and Surgical Association," reprint from the *New Orleans Medical and Surgical Journal* of recent date (April, 1883), "to give timely information of what is desired shall be accomplished by the present Legislature," is here submitted.

State Board of Health.—Article No. 178, of the Constitution, specially commands that "the General Assembly *shall* provide for the establishment and maintenance of a State Board of Health."

Although there is a Board of Health of the State of Louisiana in name, still, in fact, the General Assembly has never yet established, much less maintained, a veritable State Board of Health. The following facts render this obvious:

March 15, 1855, the law organizing the present board was enacted; its purpose was specially to establish quarantine for

New Orleans. This board was composed of nine members, six to be appointed by the Governor and to be confirmed by the Senate, and three to be elected by the New Orleans City Council; and although the jurisdiction of the board was *limited* to New Orleans itself and to the three quarantine stations which command its maritime approaches, yet said board was entitled "The Board of Health of the State of Louisiana."

From 1855 to 1883 fifteen additional laws have been enacted in reference to this board; however, all of these laws, with two exceptions specially to be referred to, have mainly increased the power and efficiency of the board as a quarantine and municipal board of health for New Orleans *alone*, without extending its jurisdiction. Successive Governors and Senates, from 1855 to the present day, have shown their appreciation of the fact that this board was a municipal and not a State board, by invariably appointing and confirming solely citizens of New Orleans as its members, thus uniting with the City Council to form a board exclusively of such citizens. The General Assembly likewise showed its appreciation of the same fact by Act No. 80, of 1877, which decreased the slight resemblance to a State board then presented by the present board, inasmuch as it reduced the appointees of the Governor from six to four members, and increased the appointees of the City Council from three to five, thus giving the city appointees a majority on the board, which our Governors have continued to form exclusively of citizens of New Orleans. It is a legislative fiction to denominate a board thus restricted in membership and power to a limited section of this State, the "Board of Health of the State of Louisiana," and it is a legislative abuse to confer on a board thus constituted authority over the extensive and numerous population and diversified interests of this great State. . . . . .

The facts and views now stated justify the following recommendations: A veritable State Board of Health should be at once established. To this board should be transferred all the power and authority, outside of the parish of New Orleans, which existing laws confer on the present so-called "Board of Health of the State of Louisiana," and to a New Orleans board of health, organized exclusively by the city authorities, should be transferred all the power and authority which existing laws

permit the present board of health to exercise within the limits of the parish of New Orleans. . . . .

Misplaced responsibility, as well as divided responsibility, is most objectionable. A striking instance of misplaced responsibility occurs in the first instance, Sections 3042 and 3039, pages 592 and 593, Revised Statutes 1870, wherein the law directs that the resident physician of the Mississippi River quarantine station *shall be appointed by the Governor;* that his salary shall be $5,000 per annum, and that he shall be authorized to employ an assistant at $2,000 per annum. It is urged that public opinion and also the fundamental principle on which depends the existence of a board of health, unite in fixing on the Board of Health rather than the Governor, the responsibility for the administration of the Mississippi River quarantine station; and, therefore, that the law should be so amended, that the Board of Health should have the same power to appoint, fix the salary of, and control the officers and employes at this station, that the Board has in respect to all other sanitary officers and employes, whether these be located in New Orleans or at the quarantine stations other than the one at the Mississippi River. (See Section 3041, page 593, Revised Statutes, 1870.) It is deemed important that, if the present laws should be so amended as to confer on the Board of Health the power to appoint the resident physician of the Mississippi River quarantine station, and also his assistant, the amended law should not fail to confer on the Board at the same time the power to fix their salaries; for, if this were neglected, there is reason to fear that the appointment even of the members of the board would be politically so managed as to be dependent on and subordinate to their pledges in behalf of some favored candidate for the office of resident physician of the Mississippi River quarantine station—an office which now has a salary of $5,000, now confers another salary of $2,000, and now distributes other patronage, so that this office rivals, in respect to patronage, that board to which it should be entirely subordinate."

From the above it appears the responsibility of the administration of this quarantine station (and by inference the same is applicable to Rigolets and Atchafalaya stations) is not on the Louisiana State Board of Health but on the Governor.

This board, which is singularly organized for a State board, is simply advisory, at least as far as quarantine administration is concerned, the feature of their public health service that we are mostly interested in. Since the publication of this petition, which was prepared for the Legislature now in session at Baton Rouge, there has been a change in the *personnel* of the board, which seems to have the confidence of the community, with the active support and co-operation of the Auxiliary Sanitary Association, a voluntary and patriotic body of influential citizens, organized for the purpose of promoting the local sanitation of New Orleans. But the inference admissible from the extract above quoted from Dr. Holt's address before the conference is there will be no material change in the policy of the board. "Reorganizing in the opening of an active campaign, it can follow no other course, however convinced of the possibility of improvement." Since the adjournment of the conference, the Governor of Louisiana, at the instance of the Board of Health by resolution passed June 9th, has issued a proclamation, to take effect July 10th, declaring a forty days detention of all vessels from a number of Mexican, Central American, and West India Island ports (see *Picayune*, June 13th). The New Orleans *States* of June 12th has an interesting editorial on this proclamation, under the caption of "Quarantine and Commerce." A few extracts and some brief comment is pertinent to this report: "It is now a settled fact that New Orleans must either abandon all purpose or hope of occupying her best and true field of commercial enterprise, or adopt a quarantine system that will insure the greatest measure of protection from yellow fever, and at the same time keep her port open to ships engaged in the Mexican, West Indian, and South American trade. The solution of the problem is not less important to the commercial growth of this city than is the success of the jetties in opening a deep passage to the sea. Indeed, we may truthfully say that the jetties are an effective quarantine that dispenses with 'detention,' an essential part of a great system that can and can alone make New Orleans one of the great commercial centres of the world. Of what worth were great ships and rich neighbors to us until a passage from our wharves to the ocean was opened? And of what worth is that passage and ships and neighbors, rich even with the wealth of Ornus

and Ind, if to protect ourselves from pestilence we must close our ports for a great part of the year against them? . . .

"Detention for forty days at quarantine is equivalent to non-intercourse. It was intended to be non-intercourse, and for the balance of the present season it destroys our trade with the numerous ports catalogued in the proclamation, and there are a number of other ports which will be placed in the proscribed list the moment yellow fever is suspected to prevail in them.

"The present system of quarantine must finally and speedily destroy not only the ridiculed fruit trade, not only all other lines of trade now existing between this city and the Southern nations, but also that vast and magnificent commerce which at no distant day must sweep over the Spanish main and the Gulf of Mexico, and from the East over the Pacific and across the Isthmus, and to which New Orleans must look for her future wealth and commercial greatness." The article goes on to commend the plan of quarantine proposed by Dr. Holt in his address as a proper solution of this question, a plan which was unanimously and enthusiastically endorsed by the conference. But it must be remembered this is an ideal quarantine, and recalls to mind a similar argument advanced by his predecessor in office, Dr. Joseph Jones.

To do justice to the Louisiana State Board of Health, I will venture the opinion, without referring to the statistics or consulting official records, that less yellow fever got into New Orleans during the past four summers than ever before in the same length of time, and what did get in was more promptly detected and successfully dealt with; but it must be noted that New Orleans was never before in its history as thoroughly watched by health organizations outside of the State. It was kept under constant surveillance during periods of danger, which gave rise to no little acrimonious feeling and expression. I trust I give no offence in stating that this pressure from a feeling of distrust, for which there was just cause, was a potent factor in bringing about the alliance between the Louisiana State Board of Health and the United States Marine Hospital Service, which apparently worked satisfactorily. I am pleased to note the following assertion from the last official report of the Louisiana State Board of Health, by Dr. Joseph Jones,

president, etc.; and that four years of official observations enables him to state positively that yellow fever is never endemic to this country; it is exotic and can be kept away by quarantine. His views on this subject, published in the New Orleans *Medical and Surgical Journal*, for March, 1879 (page 678), were ambiguous. These views are in accord with my own, and as they are germane to this report and from such high authority, I quote:

"1. Yellow fever is not indigenous to New Orleans.

"2. Yellow fever is not indigenous to Louisiana.

"3. Yellow fever is not indigenous to the Mississippi Valley.

"4. Yellow fever can be excluded from New Orleans and the Mississippi Valley by a rigid and effective quarantine.

"5. Quarantine, to be effective, must embrace not only inspection and detention, but discharge of infected cargoes, thorough ventilation, and fumigation.

"6. The citizens of Louisiana should demand that the members of the Board of Health appointed by the Governor and Common Council of New Orleans should be men competent to devise and execute the measures necessary to the exclusion of foreign pestilence from the waters of Louisiana."

And the doctor should have added that Louisiana should place at the command of its Board of Health adequate means to perform duties expected of it. While we may indulge the hope that Dr. Holt may be more successful than his predecessor in inducing his government to adopt his suggestions, we have as yet no reason to think he will, at least there was no such guarantee given at the conference, and while we may admire his enthusiasm, his perfect honesty and the beauty of his rhetoric, and pledge ourselves to give him a fair trial ***when he gets his proposed quarantine***, which is now theoretical and prospective, for the present he will please pardon our incredulity, bear with our scepticism, and, we trust, not consider us eccentric. The editorial from the *States*, above quoted, concludes at follows: "The plan of Dr. Holt means the abolition of the ancient, ignorant, and barbarous system of detention which threatens the ruin of New Orleans. The detention of an unclean vessel at quarantine for a certain number of days cannot improve her condition; on the contrary, the longer

she is detained the filthier and more dangerous she becomes; hence, outside of Dr. Holt's proposition, there is no safety except in non-intercourse. Now the question is, are we to apply Dr. Holt's system? It will require the insignificant sum of $25,000 to obtain the apparatus and put it into operation. The Federal Government appropriated $5,000,000 to remove the bar at the mouth of the Mississippi and open this port to the world; shall not the Louisiana Legislature appropriate $25,000 to make the work wrought by that $5,000,000 effective and remove a quarantine system which is as obstructive to our trade as was the bar that Eads removed? . . . . That once done, detention will be in future abandoned; our port will be opened throughout the year to vessels from all parts of the world, and no future Board of Health will ever venture a return to a system which, if it protects the health of the people, destroys the existence of the city."

There are two points I wish to briefly allude to before closing this report. One, the preservation of the public health *vs.* commercial interest. The other, State sovereignty *vs.* Federal interference. If I remember correctly (I have not the published proceedings now to refer to), in the quarantine conference of 1880, above alluded to, the great objection to Ship Island as a refuge station for infected ships by the advocates of the present system was that its adoption would result in the destruction of the commerce of New Orleans. The fact that Ship Island was relied upon last summer as a leading factor in the quarantine policy of the Gulf coast, proved this apprehension to be fallacious. The inspection service of the National Board of Health invoked by the Tennessee and Mississippi State Boards of Health was regarded by the Louisiana State Board of Health as an unwarrantable surveillance, though States were guaranteed the same privileges of placing inspectors in New Orleans if they wished to exercise it individually.

The action of the Louisiana State Board of Health in making an alliance with the Marine Hospital Service last summer, as shown by reference to the proceedings of this board, April 12, 1883 (published report, page 89), indicates that it was a preference as to the arm of the Federal service, and not the principle of Federal intervention objected to. This principle of non-intervention is clearly expressed by President Holt, if

the newspaper reports (*Times-Democrat* and *Picayune* of the 4th) herewith submitted are correct. The *Times-Democrat* says: "We do not propose to bother ourselves about either the National Board of Health or the Marine Hospital Service." The *Picayune*, the following: "Dr. Holt, of Louisiana, said he welcomed the presentation of the question. It had been looked upon as a bugbear by some, but he wanted to have the matter disposed of for good. He would say for the Louisiana Board of Health that, while it is willing to co-operate and be on friendly terms with other health organizations, it would maintain the sovereignty of Louisiana wherever that was affected. His board cared for no outside organization and asked no favors. His board would vote squarely against putting the National Board into any place of authority or power." The final settlement of this question is an important one and it is fair to assume that this is a finale of it as far as the present Louisiana State Board of Health is concerned.

QUARANTINE IMPROVEMENTS—IS THE PRESENT SYSTEM OF QUARANTINE AN EXACT SCIENCE? ARE BOARDS OF HEALTH IN THE GULF STATES DOING THEIR WHOLE DUTY?*

By JOSEPH HOLT, M.D., President of State Board of Health of Louisiana.

IT is the firm intention of the Board of Health of the State of Louisiana to adhere strictly to the policy of the quarantine pursued last year, and during the present summer and fall to push to the extremest verge of law the restrictive measures heretofore enforced. Reorganizing in the opening of an active campaign, it can follow no other course, however much convinced of the possibility of improvement.

Anticipating any inquiry which might arise touching my exact position on the subject of quarantine, I will preface my remarks, not with a *credo*, for to say I believe, implies the possibility of a doubt, whereas I know that yellow fever is transmissible, and have repeatedly seen it imported. If it can be

* Address before Quarantine Conference, held in New Orleans, June 3, 1884.

imported, the converse is instantly concluded, that its importation can also be prevented. Such a logical sequence is perfectly apparent, but experience compels its moderation.

Absolute protection against the introduction of disease is the ideal of quarantine, its attainment the aim of Boards of Health. Failure does not impair the doctrine. When yellow fever evades quarantine the error is in the method and not in the principle. Where there is a fault, there is a possibility of its correction, to accomplish which becomes the duty of those who are the legally appointed custodians of this matter.

Into the hands of the State Boards of Health is committed the whole question of quarantine, its beginning, its ending, and all the details of its execution. The Chief Magistrate of the State accepts the Board of Health as the monitor whose dicta determine his action in all the affairs of public health. He issues his proclamation and sets in motion the machinery of law by its advice. Not to do so would be personally to assume all responsibility for consequences that might flow from such action, a position manifestly hazardous and unfair toward himself.

It follows, therefore, if the action of a Board of Health be wise or foolish, the praise or the condemnation must rest where it honestly belongs.

If the methods of quarantine are exact; if its results are uniformly successful; if its administrations are equable and just to all, to that Board of Health belongs the glory, and richly it deserves the fullest recognition of its services. If, on the contrary, its methods are uncertain and contradictory; if it establish a measure and presently fly to another; detain, disinfect, and fumigate a non-infected vessel this week, and before she is out of quarantine, next week, declare a proclamation of non-intercourse, and turn her away to sea suffering enormous loss; if it drives upon a helpless few hard and oppressive measures, without warrant of law, and inflicts unavoidable injury without fear of prosecution because of the uneasy state of the public mind; if, by these very measures, it impeaches the methods it has itself established and offered as guarantees of safety; if it is fractious, and fitful, and uncertain in its ways, so that none can predict what an hour may bring forth—such a Board of Health makes its own official record and will be judged upon it.

The mills of the gods grind slowly, but they grind exceeding fine, gentlemen; and it behooves us in our stations to deal justly, humanely, and with some humility; to sink out of sight that treacherous love of self and contempt of others, that pride which must inevitably bring a downfall.

If quarantine is perfect; if human genius can devise no improvement upon its present methods; if all that science and skill, chemistry and machinery can offer is only superfluous, quarantine is then an exact science; it is final, and Boards of Health have made it so.

Let us cut, then, this thread of suspense upon which we dangle our commerce. Let us turn to the merchants of Galveston, of New Orleans, Mobile, and of Pensacola, and speaking out the truth, say to them: Gentlemen, our city is strictly commercial; take away its commerce and its existence ceases; we need every dollar that can be invested in your ships and in your cargoes, in your railroads and in your freights; but our quarantine of to-day is all that you can ever expect.

If it is destructive to any; if it is neutralizing the efforts of your newspapers, of your agents and exchanges to cultivate friendly relations and reach out for trade; neutralizing your efforts to make this city command commerce, we are sorry for you. Just as it is, so it must remain. We frankly advise you, therefore, to take your money and your ships, with their cargoes and yourselves, gentlemen, and go to New York, to Baltimore, to Charleston, or wherever else you can find a people who have modernized their systems to suit their necessities.

If quarantine is perfect, we stand acquitted though it wipe commerce from the seas. If quarantine is imperfect; if it is awkward and tedious in its details; if we have failed to call to our aid the whole power of science and skill; if we are doing by hand that which should be done by steam; if we are applying agents to kill germs and fail to kill rats and roaches; if we are cleaning ships and not driving the water through their foul holds by the impelling power of steam until bilge water is pure enough to drink; if at heart we have no faith in that we pretend to do, and in the face of danger abandon our artillery and fly to the extreme resort; if in the face of all this, year by year we sit contentedly in the eternal round of talking, reading, writing, more talking, reading, writing, and ad-

vising proclamations of non-intercourse because yellow fewer breaks out on one of our so-called disinfected vessels, while our people are languishing in poverty, and commerce stretches her white wings and sails from us—away with such custodians of a people's health, their wealth, their destiny, and commit this sacred trust to men whose brains are inventive and whose hearts are courageous, who are quick to appreciate a great necessity and bold enough to meet it.

If quarantine can be improved, necessity will beget the invention, and God will raise up men untrammelled with respect for tradition and precedent—men who esteem the accumulated literature on yellow fever as trash unless it teaches how to manage it. We may pile volumes on top of volumes until we crush the libraries—yes, and commit them all to memory—and yet not advance the only important questions of prevention and cure the one-millionth part of a hair's-breadth. What profiteth the accumulation of mere historic detail without such relevancy?

Boards of Health may gain all that was ever written or thought of on yellow fever and yet not possess wisdom. When they seek to learn rather than to teach, and in the humble spirit of inquiry search for truth, they will discover their errors, and will, in the matter of quarantine, plan and suggest remedies and urge them upon their legislative authorities. They will then possess both knowledge and wisdom, and are blameless.

But if they fail to seek, and error is not discovered, remedy cannot be applied. From that moment they are morally responsible for every dollar deflected from their people because of restrictions that could have been avoided.

If yellow fever break out in port on a vessel declared cleansed, disinfected, and fumigated, while the methods were inadequate to accomplish such results, so that scientifically she is neither clean, disinfected, nor fumigated, the Board is directly to blame, and if epidemic ensue they are chargeable. If they accomplish their work with reasonable thoroughness and the disease appear, they are exonerated. But such thoroughness is both troublesome and expensive.

It is indeed much easier for a board of health to meet and talk, and to urge upon the Governor some extraordinary

measure of restriction, which is indeed correct, if it is the only thing that can be done. But if neither the only thing nor the best thing, and injury comes of it, who is to blame? But, unfortunately, who alone suffers? Who suffers, while the Board itself may be lauded to the skies for the display of genius, and an excess of all the cardinal virtues?

In our circular letter to State Boards of Health occurs this proposition, an epitome of all our troubles: "The possibility of the introduction of infectious or contagious diseases is the chief drawback to the prosperity of the Gulf ports." It should have read: "Is *the* drawback to the prosperity of the Gulf ports." Then follows a question, the first to challenge any Board of Health organized in the Gulf States, the one great inquiry of the Mississippi Valley.

"Can an effective quarantine be enforced along the Gulf coast?" A remarkable question indeed, unless we ourselves are in doubt. But first let us ask another question which accompanies this as its shadow: "Is an effective quarantine enforced along the Gulf coast?"

Let us keep out the musty cobwebs of history, and go back only four years. Pensacola, yellow fever twice; Ocean Springs, once; Brownsville, once; New Orleans, twice. Help thou my unbelief.

An effective quarantine can never be enforced until Boards of Health cut loose from primitive methods on a par with the wooden plough and old hand printing-press, and urge upon their States measures in keeping with our civilization.

The next question in this circular letter is, "How to enforce quarantine so as to produce the least possible injury to commerce?" In the leading proposition we epitomized our trouble, in the latter question our duty. We can enforce such a quarantine only by devising plans of action such as promise a reasonable, if not a positive assurance of success.

As an illustration, let us examine such a plan for New Orleans.

When a vessel arrives at the mouth of the Mississippi, she is either infected or she is healthy. If we know her to be infected she is at once removed to the supplemental or lower station, for infected vessels only, where she will be actually cleansed, actually disinfected and fumigated, her sick removed to the local hospital.

She is an exceptional case, and will be dealt with exceptionally.

She will certainly not be allowed to endanger healthy vessels by mooring in their vicinity.

If at any time she wishes to put back to sea, she is at liberty to do so; but if she desires to come to our port, she will be detained until the Board can safely venture upon allowing her up.

We will understand better the particulars of treatment when we have described the course of a sailing ship through quarantine, no record of sickness on the voyage, a cargo of 30,000 bags of coffee, yellow-fever epidemic in Rio, from whence she has cleared. She is brought alongside the wharf at the upper Quarantine Station, where she finds every arrangement for rapid discharging and reloading of cargo. The crew, with all their effects, are at once taken ashore, where, in a room provided, everything they carry, apparel and baggage, is subjected to powerful disinfection; their clothing exchanged for other clothing already treated, and this, in turn, disinfected. They are then received at a commodious boarding-house, comfortably prepared for them, there to undergo the prescribed detention. If one should fall ill, he is instantly removed to the hospital, as distant as can be located.

Hospital experience proves that yellow fever is conveyed through the medium, not of persons, but of things. Yellow fever has never invaded the Charity Hospital except in the regular march of an epidemic. In the meantime, a full corps of acclimated stevedores are busily engaged in breaking out the cargo and transferring it to the warehouse, already built by the United States Government for their accommodation, there to undergo fumigation. As soon as completely emptied, or at least sufficiently so to permit of thorough cleansing and fumigation, the quarantine tug, a compactly built small vessel, somewhat after the fashion of a fire tug for harbor protection, is run alongside the ship. A hose, attached to a powerful forcing-pump aboard the tug, is let through the forward hatch down into the hold.

In order to flush the bilge quickly, it might be necessary to take up the floor plank, as a better examination could be had and the real condition ascertained. But whether this is

done or not, or the ship be in ballast or not, she can be speedily and thoroughly washed. The pump is started and the washing begins while the ship's pumps are set to discharging the foul bilge-water. This continues until she is washed clean not only in the floor of the hold and limbers, but the ceiling and every available part. She is now pumped out, the hose removed, and then begins the disinfection and fumigation. Another large hose attached to a powerful exhaust-fan is lowered into the same position as the first. The hatches and every other outlet are closely battened, with the exception of a small ventilating hatchway either at the bow or stern. A quantity of sulphur is put into the furnace connected with the fan and ignited. The exhaust-fan is started and sulphurous acid gas in immense volume and with tremendous force is driven into the limbers and air-strakes, into every crevice and part of that ship until she is completely filled.

In doing this we displace the mephitic and dangerous atmosphere closed in her when she started from Rio, and which, if allowed, would have been set free at our levee—the infected atmosphere of Rio to commingle with the atmosphere of New Orleans, because of the negligence of its authorities, deadly ripe, perhaps, for its reception.

We have displaced this not only with a non-infected atmosphere, but with one intensely germicidal—one that destroys organic elements in the air, or on exposed surfaces with instant greediness. As for the fumigation agent to be selected, we may use through this apparatus sulphurous acid gas, chlorine, or the nitric acid fumes, produced by pouring nitric acid upon copper filings, of which Dr. Wiblin, of Southampton, says that all goods may be safely and satisfactorily disinfected by this agent. The fumes so produced are so powerful that no animalculæ can exist in them for more than two seconds, and the portholes being closed for twelve hours, the process cannot fail to be effective. For my own part, I believe the sulphurous acid to be all that we can desire.

After a few hours the hatches are removed and pure air is driven in to facilitate clearing the ship of the fumes. She is reloaded and, with her captain on board, proceeds at once to the city, there to be discharged only by an acclimated gang.

Her export freights must be ready. She is at once re-

loaded and starts on her voyage. If the term of detention of her crew has not already expired, she touches at Quarantine to take on such as have engaged to reship, and puts to sea, with no more detention than was required to cleanse her, with the utmost expedition, which alone was worth the trouble.

Such a method would soon be adopted at tropical ports before loading, which would greatly lessen the danger and facilitate our work. To avoid complicating the legal points, the Board of Health gives the ship the option of remaining at the station with the crew on board the full term of detention, or of leaving the crew there. Owners will rather leave the crew, and so contract with them, if necessary, as soon as it becomes known that the regulations of this port will enable ships to lessen their detention. If yellow fever were to break out on a vessel conscientiously thus treated, we might truly say that cleansing and fumigation are nothing more than foolish observances to exercise a malignant spirit, mere shams to trick the people of the interior.

We might indeed abandon the hope of ever seeing any of our Gulf ports great centres of trade. But until that most unlikely thing did occur, we would adhere to our methods, and not suddenly declare a sixty days quarantine or non-intercourse, and send back to sea a vessel already fifteen days in quarantine and subjected to disinfection and fumigation. At any rate, if we did, we would not present them a bill for our services.

The word quarantine implies simple detention, originally forty days. A vessel detained ten days or sixty days is no more a healthy ship at the end of that time than she was at the beginning. To make her healthy while we are detaining her requires something more—a something suggested by common sense—which, too, has acted admirably in ports where thoroughly supplied.

She is sick; we are the physicians and must treat her. Cleansing and disinfecting a ship is like putting out a fire. She may be deluged, but if we leave the fire burning in only one small place the ship will be lost. Not because water and carbonic acid will not put out the fire, but because as firemen we do not understand the business.

In this plan, roughly outlined, are many points of detail

such as would necessarily require much thought and modification.

Some might appear as perplexing difficulties. However, a very little familiarity with the system would soon teach us its defects and the required remedies. Such obstacles are in the path of every enterprise. If the plan is not a good one let some one present a better. But let us keep on moving until we demonstrate the success or the hopelessness of our cause. Boards of health must no longer float upon a sea of uncertainty, themselves derelicts in the highway of commerce.

The great transcontinental lines of railway and their terminal ports of the East are exceedingly jealous of every port of entry of the Gulf States. They regard with intense disfavor any attempt to direct in its natural channels toward us a part of that inter-tropical American trade which they know to be richer than that of India and the islands of the East, not second to that of China.

They secretly rejoice in the ignorance of some of our superficial economists, who flippantly dispose of our tropical trade as a few bananas and some pineapples, and a few bags of coffee—a commerce which is only in its inception as compared with its future magnitude, but is even now crowding the ports of Liverpool, Havre, and New York with the richest products of the earth. The commerce of regions which more than two hundred years ago wrecked in a flood of gold the kingdom of Spain.

To enter this field in competition our States must have an equal chance with others. How disastrous, then, that system of quarantine which compels their boards of health, while earnestly endeavoring to keep out pestilence, also to suspend their commerce five months out of the twelve. A system which compels the conservators of the public health to become destroyers of the public livelihood by a coalition with a rival or combination, overwhelming in power and advantage.

Look upon this map, and you will see that the Gulf ports are central between four vast continents, and nearest to the West Indies. They command by geographical position the most favored regions of the globe. Already the busy hands of capital are dividing with canals and spanning with railways

the Isthmus of Panama and Tehuantepec, so that continents beyond may become tributary to these ports.

These cities are geographically central, but what are they in the commercial world? They have been plucked from the centre and placed down here on the lower edge.

An inefficient quarantine has struck across the face of this grand field a line, called the Tropic of Cancer, and has said to these cities: "Thus far shalt thou go and no farther."

The genius of man may project vast enterprises; it may cut canals, build marine railroads, jetty the Mississippi River, deepen harbors, establish exchanges, and compel the admiration of a world in the sublime energy which, in a time, as by magic, rears out of a chaos of material an Industrial Exposition so huge, so varied in its appointments and dazzling in its splendors that the mind reels before it.

Genius and energy may accomplish all this, but will never establish in the Gulf ports of the Southern States a commerce upon a solid foundation until municipal authorities and the people at large recognize at its true commercial value the principle of sanitation, and apply themselves earnestly and enthusiastically to a reformation in the methods of cleansing and purifying their cities, and until boards of health no longer go to war and cease to inflict arbitrary measures, declaring embargoes upon trade as the only remedy of their own deficiencies.

The plan of improving quarantine methods would cost money. Suppose it cost twenty or sixty thousand dollars, what is that compared with the value of the unobstructed commerce of a great centre, sweeping the circle of the world for trade? If it improve the guarantees against importation of pestilence, what is that amount as compared with the blessing shed upon the cities of the Gulf and the millions of people behind us.

To prevent the introduction of yellow fever one single year would justify a thousand times the expenditure. These quarantines should be perfected at any price, excepting the bartering or putting in jeopardy of one iota of the rights and sovereignty of the State.

In regard to the question of innovation, we may be told that the people of the interior are accustomed to our present ways

and will object to changes. We might tersely reply that they object to our accustomed ways and desire the changes. The people of Central and Northern Florida, Alabama, Mississippi, Louisiana, Texas, the people of Tennessee, Missouri and Kentucky, are every whit as intelligent, as well educated, as rational and progressive as we, and possibly more inventive. Their experiences give them the right to tell us that yellow fever must be kept out. They do not prescribe the way. They do not fear innovation or any other evidence of care and watchfulness. They do fear inactivity and the unvarying routine of those methods which have invited their confidence, to betray it time and again.

If a hostile fleet menaced our shore, they would demand of us a brave defence, but would not expect of us to mount our batteries with old-time, smooth-bore twenty-four pounders, and to arm our citizens with flint-locks hallowed by the memory of our grandfathers. They would be shocked and indignant if we did not call to our aid the science and enginery of modern warfare. What surely must be their amazement and terror when, in the year 1884, in the face of an enemy more implacable and deadly than a British fleet, they see us, in all the panoply of war, armed with the identical matchlock and blunderbuss of the Venetian system of 1484.

And now, gentlemen, I am prepared to answer categorically the questions propounded in the circular letter.

First, the proposition, "The possibility of the introduction of infectious or contagious diseases is the chief drawback to the prosperity of the Gulf ports," is simply to utter a fearful verity; as plain as to say, the sun gives light.

In reply to the first question, I declare, as a solemn conviction, that a quarantine vastly superior to the present can be enforced along the Gulf coast. To declare it absolutely effective would require years of testing.

In reply to the second, I believe that quarantine can be enforced in such a manner as to secure the highest efficiency with the least possible injury to commerce, so that Galveston, New Orleans, Pensacola, and Mobile will be at liberty, every month in the year, to reach out for all the trade they can get; and, above all, to recapture some of that from Baltimore and New York.

In reply to the third, I believe that non-intercourse, under a system of rational, strictly scientific quarantine, would be absurd, contradictory, the offspring of an unwarrantable cowardice.

To the fourth: Period of quarantine detention. Days of detention would be reduced to hours; because ships cleansed, disinfected, and fumigated in name would be so in fact. There could be no object in holding such a vessel in quarantine, except to serve as a hotel for the crew; which, under the improved system, would be provided on shore. Commanders of vessels would discountenance the carrying of passengers during the quarantine season.

To the fifth: The proper disposal of non-infected and infected vessels under quarantine is complete separation and isolation of the latter at a station for infected vessels only.

To the sixth: The treatment of vessels and cargoes with a view to disinfection is conscientious thoroughness in the application of scientific measures.

In the plan suggested there is no principle not contained in the present system. The only difference is that it contemplates thoroughness of execution and perfect consistency with its own doctrines.

Simple detention is the primitive method of barbarism, and, while stupidly easy to comprehend, has been uniformly a failure. Non-intercourse, the cordon sanitaire and shot-gun quarantine are expressions of terror and helplessness, contradictory of every other effort of prevention.

There is no such thing as a board of health maintaining consistently its own principles and abandoning them in the face of danger. It may do so under a pressure of expediency, but it certainly impeaches its former action and declares its lack of faith.

Finally, gentlemen, if ever the boards of health of the Gulf States begin a high career of achievement, there are but two real obstacles in the way to success.

The one is a total failure on the part of the people and the government of their States to listen to them—a deadly apathy. In such a case the board is expurgated of all blame.

The other is policy. Let boards of health beware the leaven of policy. Duty and truth are established and eternal, while policy shifts with every varying breeze, and is ever at war

with truth. Personal policy, subordinated to municipal policy, to State policy, to a vicious commercial policy, as effectually poisons a board of health as the contagion of yellow fever the city it attempts to protect. We cannot serve two masters. A board of health with policy is a board of health without truth.

Logic is the mathematics of reason. If its problems are correctly stated, its conclusions are true and unassailable. Therefore, as the sum of all that has been said, if the quarantine system in the Gulf States is not an exact science, its developments not yet perfected, the boards of health of the Gulf States are not doing their whole duty when they accept and enforce measures, crude, primitive, injurious, and make no effort to ameliorate this strain upon our commerce by invoking the power of science.

Applied science in the methods of quarantine is the only force potent to sever the coalition of the boards of health with commercial rivals, and to furnish guarantees against the importation of yellow fever worthy of respect and confidence.

DISINFECTION OF VESSELS AT THE MISSISSIPPI QUARANTINE.

DR. THOS. Y. ABY, Resident Physician Mississippi Quarantine Station:

DEAR SIR—Because of the signal failure of carbolic acid as a disinfectant and prophylactic agent after a trial more fair and extended than has ever been allowed any other; because of its excessively offensive odor and the oppressive and sometimes mischievous effects of its fumes, because of the low order of the commercial acid as a germicide and the considerable expense involved in its use, you are hereby requested to discontinue its application.

In its stead I have ordered to your station two packages of twenty-five pounds each of bichloride of mercury and the muriate of ammonia, the latter to act as a solvent. In its preparation for use, take five ounces of each and dissolve in half gallon of water, add this to forty gallons of water in a cask having a faucet. I have sent three large watering-pots with a fine rose or spray. Your men can easily and quickly wet

down a ballast pile or a deck, and it needs no repetition when once thoroughly applied.

In regard to decks, the saloon, and apartments where you may deem it necessary to make the application, you can relieve all possibility of any danger from the metallic salt by having it washed off after having remained on a few hours.

The advantages of this agent are briefly these: The mercuric bichloride stands pre-eminently above all chemicals as a universal germicide. Not only are definite organisms immediately destroyed, but all protoplasms and albuminoids are devitalized by it. It is efficient to accomplish this work when applied in a solution so weak as not to be recognized except by chemical reagents. It is devoid of color or smell. It does not poison the air by vaporizing, but adheres in an innocuous form to the surfaces upon which originally applied. Its cost is about one-eighth that of carbolic acid.

I feel that this transition is quite as much of a relief to you, my dear doctor, as to the afflicted people on shipboard, who must surely suffer severely from the stifling fumes emanating from carbolic acid applied to surfaces heated by a July sun. The position of those people confined on shipboard, particularly in the instance of women and children as passengers, must at times have been most distressing. The Board of Health heartily joins with you in the satisfaction and sense of relief afforded by this change, which is an important step in the great work of humanizing our quarantine.

I remain, with high esteem, yours very truly,

JOSEPH HOLT, M.D.

President Board of Health State of Louisiana.

NEW ORLEANS, July 17, 1884.

SIX OF ONE AND HALF A DOZEN OF T'OTHER.—"I must caution you," said the physician, "against drinking wine."

"But I drink very little, doctor," remonstrated the sick man.

"That may be, but you must leave it off altogether. Wine, nowadays, is so adulterated with drugs and chemicals that it is unfit for human consumption."

"What would you advise me to take?"

The doctor then wrote out a five-dollar prescription of drugs and chemicals.—*Philadelphia Call.*

COUNTY ASYLUMS.

A SANITARY SURVEY OF THE POOR-HOUSES UNDER DIRECTION OF THE STATE BOARD OF HEALTH OF INDIANA.

REPORTS have been received at the State Health Office from eighty-seven out of the ninety-two counties in the State, regarding the sanitary condition of the county poor asylums, in answer to questions propounded by the board. The counties not reporting are Allen, Blackford, Lake, Marshall, and Steuben. The matter contained in the several reports will appear in the annual report of the Health Board, the results of the county surveys being compiled for that purpose. The interrogatories addressed to the local health officers are fifty-three in number, and embrace every point of interest in the sanitary condition of the county asylums. The showing is not, in any sense, creditable to the State, and there are many counties in which radical and immediate reform is necessary. This is especially true of the treatment of insane paupers; but it is regarded in extenuation that the superintendents are doing all in their power with the means at command. In submitting his report a well-known physician says that "the condition of the indigent poor at the so-called asylum is certainly as lamentable as the report indicates." "I have many reasons," he adds, "to be thoroughly disgusted with my connection with the institution as physician in charge, not the least of which is being compelled to make a report to the health officer of the character inclosed." Dr. Latta, of Elkhart County, in submitting his report, says: "The buildings are very poor, insufficient, inadequate to the demands, illy ventilated, and, in fact, not as good as ordinary cattle-sheds." This, however, is a temporary condition, due to an unsettled matter concerning permanent location.

The report shows that in seventy-five cases the drainage is good, and in seventy-seven the ground is clean; fifty-four of the asylums are built of brick, two of stone, and twenty-six of

wood; twenty-five of the asylums are well ventilated, eight are not well ventilated, and fifty-four of the reports are silent on this subject. In twenty-five cases the asylums have offensive odor, and in nine asylums the rooms are not kept clean. In three institutions as many as ten of the paupers occupy the same sleeping rooms, in five others there are six to each room, and the average is not less than four to the apartment, and generally the rooms are small and have low ceilings. In twelve of the reported counties the beds are said to be unclean and wanting in tidiness; in six they are infected with vermin; in seven asylums the interior of the buildings is neither whitewashed nor disinfected; in sixty-four cases the water supply is from wells, in sixteen from cisterns, and in three from springs; in six cases the water is impure, and in nine not safe from pollution, one report stating that there is a graveyard in close proximity to the spring.

The total number of inmates in the counties reported, 3,539, of which 1,855 are males and 1,684 are females. Of the total number, 633 are under fifteen years of age, and the oldest inmate is eighty-eight years of age. Included in the total of 3,539, 610 are insane, of whom 206 are males and 214 females; 331 are idiots, and of them 170 are males and 161 females. About 250 deaths have occurred in the asylums during the past year. Marion County has 205 paupers, 87 of whom are insane; Wayne, 89 with 12 insane; Tippecanoe, 111 with 44 insane; Vanderburg, 86 with 25 insane; and Vigo, 107 with 17 insane. In all the asylums, with four exceptions, the inmates are employed at manual labor. The reports are unanimous in saying that the insane patients are well treated, but in fifty-two counties cells are used as means of restraint. In Madison County "restraining straps" are used.

In "suggestions" made to the board, and which close the report of each health officer, there are many things of interest to the people of the county wherein the evils pointed out are said to exist. In St. Joseph County, for instance, the washing at the asylum is done in the basement of the building, and "the steam and odors permeate all the rooms and make the walls of the building damp." The commissioners should follow the suggestions of the health officer and erect a wash-house. In Orange County the construction of the house is said to be

bad. "The sitting-rooms are surrounded by the sleeping-rooms, and there is, when the doors are closed, neither light nor ventilation. The room often becomes too hot, but the inmates do not know it. The atmosphere is not pure, for too many remain too long in the same room."—*Indianapolis Journal.*

NOTES ON EDUCATION ABROAD, COLLECTED BY THE BUREAU OF EDUCATION.—Dr. Josten has published some statements upon the care of the eyes of school-children in the Eleventh Annual Report of the Westphalian Society for Science and Art which are worthy of careful consideration. He recommends, first, that test letters be placed on the walls of the school-rooms, and that the sufficiency of light in the room be measured by the ease with which they can be read, and that whenever the light measured in this way falls below the required amount, all writing by the pupils should be stopped. Second, that writing and drawing should be confined to the second morning hour, because the light is best at that time, the eyes of the children are not fatigued, and the fifteen minutes' recess follows immediately after. Third, that care should be taken to keep the children in an upright position while writing, and that the contrivances for keeping them in that position, called in Germany *Geradhalter*, should be used as a kind of punishment for not sitting up straight. (Every class-room in the elementary schools, he says, should have four or five of these instruments.) Fourth, that the black slates, which are so injurious to the eyes, should be replaced by artificial white slates. Fifth, that the best lighted rooms be assigned to the youngest scholars, and that they be prevented, as much as possible, from writing and reading with their eyes too near their books. Sixth, that the teacher should notify the parents of children who are found to be near-sighted, or who have other troubles with their eyes in the first years of school, and advise them to consult a physician on the subject.

THE longest river in the world is the Mississippi, reckoning from the source of the Missouri, being 4,300 miles, or equal to the combined length of about thirty-three millions of Esterbrook's mammoth falcon pens and penholders.

PREVENTIVE MEDICINE IN THE MEDICAL COLLEGES.

NEW YORK, July 28, 1884.

EDITOR OF SANITARIAN: In the article on "Medical Colleges and Preventive Medicine," in the July number of THE SANITARIAN, there is an important omission. A modest institution in this city, known as the "Woman's Medical College of the New York Infirmary," has supported a chair of hygiene from the first year of its existence. I believe it was the first in this country to adopt the subject as a special chair, and one of the first, if not the first, to introduce a graded course of study, and to establish a standard of preliminary education on the part of students as one of the requisites for matriculation.

You will receive within a day or two the Sixteenth Annual Catalogue and Announcement, in which, if you examine it, you will see a brief outline of the course on hygiene, and also the examination questions for 1884. I will add that three or four of the students answered all of these questions with minuteness and took maximum marks; one made a slight or partial failure in one question; and all of the others took fair marks. You may say that many important branches of the subject are not represented in the questions. This is true; but had the examination been on personal hygiene, offensive trades, contagious diseases, disinfection, quarantine, etc., the answers would have been equally ready and minute.

E. H. JANES, Professor of Hygiene.

ST. JOSEPH, MO. 1884.

EDITOR OF SANITARIAN: In your July number I notice an article in reference to "Medical Colleges and Preventive Medicine," giving a list of the colleges that have a chair on this subject. The fact that the St. Joseph Medical College has such a chair and was not mentioned tempts me to write to you. The St. Joseph Medical College has a separate chair of hygiene, one lecture per week during the entire session, and a final examination is required before a degree is granted. The "St. Joseph Medical College" has the most rigid requirements and examinations of any of the Western schools, and as it pays for *this* in *small* but intelligent classes, we deserve that it should receive the honor due it. F. P. HOYT, Professor of Hygiene.

EDITOR'S TABLE.

CHOLERA AND OUR NATIONAL HEALTH AUTHORITIES.

WE had about half prepared an editorial under this head when we received from Providence, R. I., a marked copy of the *Providence Journal*, of July 25th, containing a communication on *Cholera Quarantine*, which is so general in its application, and expresses so much of what we would have said on the subject, that we gladly substitute, and commend it to public attention. It is scarcely necessary to remind the readers of the SANITARIAN, that Providence is the home of the veteran sanitarian, Dr. E. M. Snow, and we risk nothing attributing this communication to him :

It seems to be fated that neither the people nor public authorities will ever learn wisdom from experience, in regard to epidemics. The people become frightened and unreasonable from causes for which no sensible reason can be assigned. Sometimes their fears are increased, and a panic is the result, from the foolish action of the authorities.

The authorities themselves, in past times, have often acted from traditionary reasons, or from superstition, and their action has been without good sense.

If we are not mistaken, a high dignitary in the religious world once issued a bull against a comet; but it had no effect that we ever heard of in preventing comets.

A President of the United States once appointed a National Fast to prevent the cholera while the disease was epidemic throughout the country; and the day was, as might be expected, followed by a large increase of the disease.

The City Council of Providence once passed an ordinance entitled, "*An Ordinance prohibiting all persons from New York*, or any other city, town, or place infected with malignant cholera, *from entering into the city of Providence*," and the ordinance was enforced; but it did not prevent the cholera from appearing in Providence twelve days after the passage of the ordinance.

The town of Fall River once prohibited the mail stage from Newport from entering the town, but the cholera appeared in Fall River as soon the mail stage stopped.

The Mayor of Hartford, a few years since, issued a proclamation to prevent the epizoötic among horses from entering that city; but the disease appeared in all parts of the city almost simultaneously with the printing of the proclamation. These examples might be multiplied by thousands.

And now, after all this experience, on the twenty-third day of July, in the year of grace one thousand eight hundred and eighty-four, when there is not a case of cholera on the continent, and not the slightest probability of its appearing in Providence this year, the Board of Aldermen of our city decides that the liability of the transmission of cholera to this city requires that *immediate* measures should be taken to prevent its introduction; and they have, therefore, established a quarantine against Asiatic cholera.

We are utterly at a loss to find any good reason for this action. In truth, we think it demonstrable that no good reason for it is possible. Why did the Board take this action? We feel confident that our health officers never requested, advised, or recommended such action? What special knowledge has the Board of Aldermen upon the subject that the health officer does not possess? Why should they take action of such importance without his recommendation?

There is not a case of Asiatic cholera on this continent; and not a case has been reported on any vessel coming to this country. There is no probability of there being any Asiatic cholera in this country *in an epidemic form*, this year; certainly not in the Northern States.

But supposing the cholera should reach this country this year, is there any probability of its coming in vessels to Providence? The whole commerce of Providence, in vessels from Europe, does not exceed half a dozen, more or less, cargoes of brimstone and as many of scrap iron, in a year. With France, the only country where cholera exists at present, we have no direct trade whatever. Certainly the European commerce of Providence is not sufficient to afford any good reason for the establishment of a quarantine at this time.

Neither does the past experience furnish the slightest reason for fearing that cholera will be brought to Providence by vessels. There never was a case of cholera brought to Providence in that way, not even when cholera was prevalent throughout all Europe, and when the foreign commerce of our city was many times greater than it is now.

In fact, we may affirm that, in all the commerce of Providence, coastwise and domestic, as well as foreign, not half a dozen cases of infectious or contagious diseases, of all descriptions, have been brought to Providence in vessels during the last twenty-five years. But more than ten times that number

of cases of contagious and infectious diseases have come to Providence in that time from both New York and Boston. When we have had Asiatic cholera here it has always come, *apparently*, from New York. At least, it has never appeared in Providence until after it had become very prevalent in New York.

If our Board of Aldermen proposes to fight Asiatic cholera with quarantine, *to be consistent*, they will be compelled to establish an absolute non-intercourse quarantine against New York, probably within one year from this date. Is the Board ready to do that?

Will it even be consistent in carrying out the action it has already begun? If the quarantine the Board has established is of any use; if there is the slightest probability that it will catch a single vessel with cholera on board, consistency requires that the Board should immediately provide a hospital for the sick, a building for the detention of the crew and passengers; buildings for the storage of the cargo, and for fumigation and disinfection. These are all necessary for an efficient quarantine. The Board of Aldermen has not as yet half done its work if it would act consistently, or if there is any good reason for the action it has already taken.

But there is no occasion for alarm on the part of the people, on account of the action of the Board. No cholera will be caught by the quarantine in Providence; not a vessel with it on board, nor a case of the disease will ever be seen at our quarantine.

We may go further and say, what is the opinion of many eminent sanitarians, that there is no proof, nor any good reason, for believing that any quarantine ever prevented Asiatic cholera from coming into any country or any place. It is a disease that defies and overleaps all barriers of that description.

In the present crisis Presidential proclamations, orders from the Secretary of the Treasury, and sensational manifestoes from the Surgeon-General of the Marine Hospital Service; all these combined with local and general quarantines; all the foolish action thus far taken, and the still more foolish action yet to be taken; all are utterly useless to stop the progress of the disease, and will not postpone for a single day, or a single hour, the *epidemic* prevalence of Asiatic cholera in this country. If it comes, as it seems probable that it will another year, the quarantines in our larger cities may keep out some cases of the disease, and if judiciously administered, may be highly useful; *but they will not stop the epidemic.* We ask our readers to remember this statement, and fifteen months from this date, to compare it with the facts.

Whatever may be our views about quarantine, or about

the character of Asiatic cholera, all are agreed that the most useful, and the most efficient means for its prevention, are internal sanitary measures faithfully and judiciously administered, *and at the right time.*

NATIONAL, STATE, AND LOCAL BOARDS OF HEALTH REPORTS.

THE NATIONAL BOARD held a meeting July 30th and elected officers as follows: President, Dr. James L. Cobell, of Virginia; Vice-President, Dr. Stephen Smith, of New York; Secretary, Colonel George E. Waring, of Rhode Island.

CONNECTICUT.—Report for month of June compares favorably with the same month for previous years, except that the lighter fevers, and especially influenza, have been more than ordinarily common. Thus from Willington almost an epidemic of influenza is reported, and many cases of throat trouble, and to a less degree the same, especially the catarrhal and throat troubles, is true generally. Whooping-cough has been very prevalent in Hartford, Norwalk, Stafford Springs, New Hartford, Willimantic, Waterbury, and in a portion of Ridgefield, which indicates its diffusion. Scarlet fever ranks next. After a marked decline and total disappearance in many places it has reappeared in considerable virulence. The indications are that the disease is spreading and is rather increasing.

Diphtheria is less prevalent than in the spring, but shows a slight increase over last month. It still lingers in Hartford. The deaths, eight in number, are just double the total mortality in Bridgeport in 1883 from diphtheria, although that city, before the efficient sanitary work done of late, used to report seventy-five or more deaths for a series of years. Four deaths are reported from Willimantic, and cases usually of a not very malignant type are reported from eight towns. The prevalence of these diseases is unusual for June unless an epidemic exists. In most of the cases filth conditions are easily traceable. The overflow of filth from a soil-pipe on the lower floor of a three-story tenement house, and a broken earthenware outlet-pipe from the house to the sewer were associated with five deaths, and sink drainage percolating through a cellar wall with two others; faulty plumbing with the greater part of those in the cities.

INDIANA.—Second Annual Report of the State Board of Health for fiscal year ending October 31, 1883, 8vo, pp. 335. The drawbacks consequent on some unseemly litigation in the organization of this board a year ago have evidently been an obstacle to the progress of sanitary work in this State, but it is gratifying to notice that its future now appears to be on a substantial footing. Besides contributions by each one of the five members of the board, there are ten other contributors on subjects more or less connected with practical sanitation, a summary of sanitary authorities and associations, reprints of circulars issued in the promotion of the work of the board, list of physicians and accoucheurs in the State, and report of vital statistics by the secretary and executive officer, Dr. E. S. Elder.

Total number of deaths reported during the year ending September 30, 1883, 14,925, including 740 from violence, 800 still-births, 245 premature births, 274 of old age; 3,816, or 25.5 per cent. from zymotic diseases, 3.4 less than for the previous year. Upon this class of diseases the secretary remarks:

It is to this great class that official hygienic and sanitary regulations are mortal enemies, and in the light of progressive sanitary science we now feel authorized to say that the continued presence or frequent destructive visits of any one of these diseases is a reproach upon the sanitary intelligence and industry of any land, and thanks to the efficiency of hygienic supervision, the deaths in the city of London have been reduced from forty-two to twenty-two per thousand; in Paris from fifty to twenty-four per thousand; in Liverpool to *six per thousand;* in Manchester to *three per cent.;* in the city of New Orleans from seventy per thousand previous to and from 1850 to 1855 to twenty-five per thousand since 1879 (p. 124).

The *italics* in the foregoing paragraph are ours.

The statement is evidently mixed. The reductions in Liverpool and Manchester probably refer to the reduction of zymotic diseases, and not, as stated, to the whole death rate, as the death rates of both Liverpool and Manchester are considerably in excess of London.

Of the deaths from zymotic diseases, the greater number were from diarrhœal diseases, 793; typhoid fever, 614; diphtheria and croup, 511; cerebro-spinal fever, 218; malarial fever, 150; typho-malarial, 111; scarlet fever, 114; measles, 140; whooping-cough, 183.

For vaccination, *bovine* virus is advocated to the exclusion of all other. "Scabs, cones or crusts of either human or bovine virus should *never* be used. They may contain irritating matter, syphilitic, and possibly scrofula poison." This restriction is, in our judgment, much stronger than facts from a great variety of sources justify, both in regard to the greater safety and efficiency of bovine over humanized virus, and lymph over scabs. Indeed, the greater weight of evidence is in favor of the scab of humanized virus, being less likely to provoke irritation or other irregular results than lymph, bovine or otherwise, and at least equally certain in protective power.

The secretary urges compulsory vaccination as the only means of securing its full benefit.

Births reported, 37,695; marriages, 19,562.

These statistics of deaths, births, marriages, are not considered complete, but the ratio not reported is gradually lessening and promising, ere many years, to be wholly overcome.

KENTUCKY.—A State Sanitary Council of Kentucky will be held at Elizabethtown, Wednesday and Thursday, October 1 and 2, 1884, under the auspices of the State Board of Health.

The Council is a voluntary, philanthropic organization, and its object is to bring together representative men of the State of every profession, who are interested in the great and growing questions of Sanitary reform, for a comparison of views and the discussion of methods relating to the prevention of sickness.

At each session there will be addresses or papers, in a popular form, on subjects of general interest in connection with the *Public Health*, each address or paper to be followed by a discussion of the subject treated.

Among the subjects which it is expected will be presented and discussed are the following: "The Prevention of Contagious and Infectious Diseases," "Special Precautions to be Used Against Cholera," "The Sanitary Problems of Elizabethtown," "Adulterations of Foods and Medicines," "The Relations of the School to Sanitary Work," "The Relations of the Medical Profession to Sanitary Work," "The Physical Danger of Alcoholic Beverages," "Personal and Domestic

Hygiene," "The Preservation of the Eye-sight," "Ventilation," "Sewerage," and "The Disposal of the Dead." It is expected that the papers presented will be original contributions on these or other practical health topics, and that when read they will become the property of the Council.

For any further information apply to the Committee of Arrangements, or address J. N. McCormack, M.D., Secretary, Bowling Green, Ky.

MARYLAND announces a Sanitary Council to be held at Blue Mountain House, Western Maryland Railroad, September 17th to 19th, with the continued purpose of awakening an interest in sanitary reform throughout the State, and to prevent, as far as possible, the introduction and spread of epidemic and pestilential diseases. It is hoped that representative men of every profession or business, as well as the philanthropic women of the State, will attend and endeavor to forward this humane work.

The place of meeting is an attractive one—seventy-two miles from Baltimore on the Western Maryland Railroad. Five trains each way, daily. Connection at Union Station, Baltimore, with New York, Philadelphia, and Washington trains, and at Hagerstown, with the Shenandoah Valley Railroad, to and from the South and Southwest.

MICHIGAN.—For the month of June, compared with the same month for six years—1877 to 1882—cholera morbus was more prevalent, pneumonia and measles less prevalent, and intermittent fever and remittent fever considerably less prevalent.

For the month of June, 1884, compared with the average of corresponding months for the six years, 1879–1884, the temperature was higher, the absolute humidity slightly more, the relative humidity the same, and the day and the night ozone less.

MISSOURI, State Board of Health Proceedings, at Semi-Annual Meeting, July 8–10, 1884.—A pamphlet of twenty-eight pages, containing general rules for the restriction and prevention of small-pox, diphtheria, scarlet fever, Asiatic cholera, typhus fever, typhoid fever, etc., etc., a paper on Hog Cholera, by Dr. W. B. Conery, and a brief report by Dr. J. C. Hearn, Secretary, on the progress made in organizing and prosecuting the work of the Board.

NEW YORK, Third Annual Report of State Board of Health, 1883, pamphlet, pp. 379.—Nomenclature of Diseases; Monthly Bulletin; Extracts from Fourth and Fifth Annual Reports; Report on the System of Sewerage for the Village of Peekskill; Report on Complaint Against the Glen Cove Manufacturing Company; Report on the Drainage of Tonawanda and Oak-Orchard Swamps; Report on Malaria at Castleton, Rensselaer County; Report on Epidemic of Enteric Fever in Port Jervis; Report on Sucker Brook, Canandaigua; Report on the Sewerage of the City of Kingston; Report on Plan of Sewerage for the Village of Malone; Report on the Sanitary Condition of the City of Schenectady; Report on the Unsanitary Condition of the Village of Bath, and the Remedies therefor; Report on Trichinosis at Arietta.

(1.) The first eighty-four pages of this Report is devoted to a general summary of the subjects which have engaged the attention of the Board, list of the standing committees, abstract of minutes and transactions, and report of Executive and Finance Committees. Next follow:

Report of Sanitary Committee; Report of Standing Committee on Registration and Vital Statistics; Report of Standing Committee on Public Institutions; Report of Committee of Quarantine; Report of Standing Committee on Drainage, Sewerage, and Topography; Report on Prevalent Diseases; Report on Repressing and Preventing Contagious Diseases, and on Contagious Disease-Refuges and Temporary Hospitals; Memorandum upon Vaccination and the Maintenance of Vaccine Virus; Sanitary Inspection of Emigrant Trains and Immigrants passing through the State; Report of Special Committee on Effluvium Nuisances and Sanitary Government—Principles and Facts. Sanitary Documents: Abstracts of the Laws relative to State and Local Boards of Health; Modes and Examples of Sanitary Procedure in Given Cases and Cases likely to Arise; Plan of Organization of Local Boards of Health; Helps and Rules concerning Registration; Forms of Papers relating to the Prevention and Control of Epidemics, etc., etc.

Taken as a whole these committee reports are admirable condensations of the subjects considered, and of much broader significance than the occasions which evoked them. For example, the work of the Sanitary Committee shows, proportionally,

the extent of food and drug adulteration: Of 33 samples of cream of tartar, 22 were adulterated; of 7 of mustard, 6 adulterated; 23 of pepper, 8 adulterated; 15 of cinnamon, 4 adulterated; of a total of 194 various food samples, 50 were found to be adulterated; and of 92 samples of drugs, 32 were adulterated. The samples were purchased in nine different towns in the State. There were 24 cases of prosecution based on the findings. Of ten samples of drinking water, from as many towns and cities examined, two only are reported "good." Report of Committee on Quarantine shows the special efforts of Dr. William M. Smith, Health Officer of the Port of New York (chairman of the committee), to prevent the introduction of small-pox by immigrants, and gives several striking examples of the incompetency of the medical officers of the immigrant ships: One reported "prickly heat" in a case of typhus in the eighth or tenth day of development. . . . "Not long since one of the surgeons of an incoming steamer was so disabled by inebriety as to be incompetent to sign his name legibly to the usual affidavit, and when told by the Health Officer that if found again in the condition he was then, he would be likely to be quarantined, he was too stupid to understand the warning. The surgeon of one of the finest steamers that cross the Atlantic, and whose saloon list usually counts in the hundreds, on more than one occasion on arrival at the New York Quarantine has been too indisposed from the same cause to walk or talk naturally. This incompetency is accounted for, mainly, by the conditions on which the medical officers are engaged and their surroundings—such companies as do not obtain competent service.

"The small compensation given the surgeons of passenger steamers is an invitation to the best talent to stay at home, and a bid for the inexperienced, incompetent, and dissolute to seek the position." The Report on Drainage, Sewerage, and Topography is the most useful one in the volume—utilizes the knowledge of local engineers and health officers in numerous places, in addition to an accomplished engineer in the service of the Board, and the comprehensive knowledge of the accomplished chairman of the Committee, James T. Gardner, Esq., Superintendent of State Survey. The information collated in this report in regard to foul water-courses, impure

drinking water, filthy soil, etc., as factors in disease, is worthy of the widest possible distribution, not only with reference to the particular places described, but the common negligence of conditions reported upon everywhere. The Reports on Prevalent Diseases, Prevention of Contagious Diseases, Sanitary Government, etc., are excellent summaries of generally accepted knowledge.

(2.) *Nomenclature of Diseases.* An elaborate statistical table of the Nomenclature of Diseases appears to have been among the last work completed by the late Secretary of the New York State Board of Health, Dr. Elisha Harris, deceased. To the subject of vital statistics he devoted much attention for many years of his studious life, and most of all that has been contributed to this subject over other names, in the United States in recent years, has been drawn from his labor.

The table is issued as No. 65 of the current series of papers of the State Board of Health of New York, and addressed to all registry officers and physicians in the State. It is based upon the nomenclature of diseases and causes of death as prepared by the Royal College of Physicians, and a committee (of which Dr. Harris was the life) of the National Board of Health of the United States.

All departures from the classification or arrangement of the committee of the Royal College are simplifications, and, to avoid confusion, are noted :

" As the registry in the State Bureau of Vital Statistics and throughout the State employs the plain English names of the causes of death when practicable, and will only use the Latin in cases that, in this nomenclature, are more clearly expressed in the latter language, we give the English list in the *first* of the *four* columns. These four columns present on each line an identical name in English, Latin, French, and German, for each cause of death, with the design to aid health officers and registry clerks to record and report in accordance with the English. Names not enumerated in these columns should be locally registered in the terms certified, unless known to be synonymous with English words that will be unequivocal. Sanitary and statistical reasons render it desirable that in any case of importance the multiple or contributing causes of death should be certified and registered, so far as they are essential

to a correct record—as explained in the supplementary memorandum following this tabulated nomenclature."

Considering the conceded leadership of Dr. Harris in this branch of sanitary science, and his substantial contributions to it, it is reasonable to suppose, and to be hoped, that this carefully revised and practical result of his labor will be adopted as the system of registration throughout the United States.

(3.) *Monthly Bulletin.* It is with special satisfaction that we welcome monthly bulletins of the New York State Board of Health beginning with the month of May. But this being confessedly incomplete for some places, we take the one for June for comment. It comprises one hundred and seventeen cities and towns. These are grouped into regions or districts as follows:

Maritime, Hudson Valley, Adirondack and Northern, Mohawk Valley, Southern Tier, East Central, West Central, and Lake Ontario and Western. The head-lines comprehend: population, annual death-rate per thousand, deaths under five years, percentage of deaths under five years to total, cerebro-spinal fever, typhus fever, typhoid fever, malarial diseases, small-pox, scarlet fever, measles, erysipelas, whooping-cough, croup and diphtheria, acute respiratory diseases, consumption, puerperal diseases, diarrhœal diseases, diseases of digestive system (not diarrhœal), diseases of urinary system, diseases of circulatory system, diseases of nervous system, accidents and violence, old age and unclassified. There is room for improvement by summing up the results in the several districts, that the relative mortality from different causes and the comparative healthfulness—as measured by the death-rates—may be readily comprehended. The highest mortality of any city or town in the State for June was Prattsville, a town of 1,118 population only, in the Hudson River Valley, 53.66 per 1,000, all over five years of age, and none from zymotic diseases. The lowest was from Phelpes, a town of 7,000 population, in the Western Central district—one death only and that from old age—1.71 per 1,000.

(4.) The extracts from forthcoming reports forcibly indicate the hold on a substantial foundation and thoroughly organized system of progressive sanitary work, and the skill of the new Secretary, Dr. A. L. Carroll, in pioneer work no less than in

his ready grasp of the foundation so well laid by his lamented predecessor, the late Dr. Harris.

TENNESSEE.—Dr. J. Berrien Lindsley has been elected Secretary and executive officer of the Tennessee State Board of Health, in place of Dr. C. C. Fite, whose resignation was noticed in the July number. Dr. Lindsley is so well known for his devotion with all his heart to whatever he undertakes, and for his executive skill as an organizer in the practical work of associations and societies, that the State Board of Health of Tennessee deserves the congratulations of all sanitarians for the wisdom it has shown in electing Dr. Lindsley to this important office.

WEST VIRGINIA.—At the annual session at the State Board in Wheeling, July 22d, the Board was reorganized by the election of Dr. T. A. Harris, of Parkersburg, as President, and Dr. James E. Reeves, by acclamation, Secretary.

In view of the danger of a visitation of cholera in this country, the Secretary was ordered to put the State in the best possible sanitary trim; and he was also instructed to attend the conference of State boards of health at Washington, D. C., announced to convene August 7th.

NEWPORT, R. I.—At a recent meeting of the Newport Medical Society there was a goodly attendance of out-of-town physicians, who resort thither for recreation, and a lively discussion on cholera germs, and local conditions favorable to their propagation.

A paper was read upon the "Relations of Micro-organisms or Germs to Infectious Diseases, Especially Cholera," by Dr. Henry O. Marcy, of Boston. He gave a brief account of the results arrived at by Pasteur, of France, Lister, of England, Koch, of Germany, and Formad, Sternberg, Pumpelly, and Smythe, of this country, and then detailed his own experiments, during which his assistant, Dr. Nelson, of Cambridge, who is now in Europe for research under the direction of Koch, artificially contracted diphtheria, as other observers have done under similar circumstances, and nearly lost his life.

Drs. Le Roy Satterlee and William T. Lusk, of New York, Surgeon Parker, of the Torpedo Station, and others took part in the discussion which followed. All were convinced of the

direct transmission of zymotic germs from one person to another, by the several methods of contagion peculiar to the diseases in question, and were satisfied that the control of these scourges, especially in the direction of prevention, was already to a large extent possible. Professor Lusk, especially, gave personal results of his own. In a lying-in hospital under his charge in New York, where the patients were of peculiarly unpromising character, most of them being "street cases," consisting of drunkards and other abandoned women, likely to be constitutionally diseased, the mortality had, under strict sanitary precautions, been reduced to an astonishingly low percentage. In a late series of some two hundred and fifty cases, scarcely a single one died, although the hospital was merely an old engine-house.

Dr. Marcy had shown that while it was easy to detect, cultivate, and transplant to new localities the germs of infection, it was extremely difficult to destroy them, even by the most powerful disinfectants and germicides, such as carbolic acid and corrosive sublimate or bichloride of mercury, and that the only safety lay in their starvation by depriving them of the congenial conditions, of filth, engendered and perpetrated by personal and civic neglect, under which their development and propagation were most rapid and sure. He referred to the apparent contradiction between Florence Nightingale in her communication to the *New York Herald*, and Dr. Koch in his official letter to the mayor of Toulon, published recently in the *Providence Journal* and elsewhere, the one of whom claims that personal contact with cholera was not to be feared, while the other strenuously condemns the possibility of even the slightest risk of personal contagion. Dr. Marcy proved to a demonstration that the true safety lay in the mean between the two extremes of opinion, and that constant and perfect sanitation, with avoidance of both direct and indirect exposure to the disease, were both required. Through local quarantine of such infected or even suspicious cases, or seclusion of it from the public contact, the spread of the disease might be arrested, but it was of the first importance that general sanitary measures should also be adopted. This should be done not merely at the request or complaint of individual citizens and upon located premises, but whenever, after a general and thorough inspection of

the whole city, it should be found required. Dr. Marcy referred in fitting terms to the great misfortune it was to the whole country that the protective work of the National Board of Health had been so seriously lessened by the failure of Congress, as so-called "practical" men, to appreciate the value of the suggestions of "scientific" laborers, who were in reality their most indispensable coadjutors.

Reference was made in a general way, during the discussion, to Newport conditions at the present moment; the absence of a skilled board of health, or of one with any pretensions to personal knowledge of what should be done, in an emergency like the present, to allay the public anxiety and to protect the city; to the many dangers pointed out by Mr. Bowditch, in his house-to-house survey, dangers which continue to exist, almost all of them, with but very partial abatement; to the unfitness for drinking purposes of most of the wells, and the still unsatisfactory condition and frequent offensiveness of the public water supply; and to the fact that no provision whatever exists for the reception and isolation of infectious cases which may occur in private dwellings, boarding-houses, or hotels, all solely from the disinclination, for reasons of personal pride and selfishness, of the aldermen to yield to the act of the Assembly by which they were to transfer the protection of the city in these matters to a separate and properly constituted board of health, with full powers. Despite the recent seeming activity of the city authorities, which was far more apparent than real, it was shown that with the exception of the mere commencement of a sewer system that may become effective in the distant future, the real condition of Newport, as regards the protection of the public health, remains almost precisely the same as it was when attention was first directly drawn to the subject several years ago. Scarlet fever was prevalent in the city at the present moment, and within a very few days there had been a death from diphtheria, a state of things conducive to the development of what is known among physicians as the "epidemic atmosphere," than which nothing could more certainly invite the appearance of cholera.

The thanks of the Society were voted to Dr. Marcy for his important communication, and at the suggestion of Surgeon Parker, U.S.N., it was thought expedient to communicate a

summary of the views expressed to the public through the medium of the Newport *Daily News*, of which this is an abstract.

THE NEWPORT SANITARY PROTECTION ASSOCIATION REPORT, for 1883–4, shows creditable progress under private auspices. Meanwhile an over-wise civic administration, which arrogates to itself all needful sanitary knowledge but never exhibits any, apparently contents itself with the defensive work of the Association against thousands of pet cesspools and other filth collects, awaiting the reckoning which is sure to come sooner or later, to the great detriment, if not, indeed, to the total destruction of the sanitary reputation of any place which tolerates them.

The plan of sewerage of the city suggested by Mr. E. S. Chesbrough, of Chicago, in 1880, was apparently adopted by the city government last year, and although there has been considerable progress made in the work, it has been with such modifications and adaptations to existing old and defective sewers as to raise the question among intelligent observers, whether it will not ultimately result in injury instead of benefit.

The water supply, also, is still unsatisfactory. "There is reason still to believe that sufficient care is not yet taken to guard it from all external causes of pollution."

The "board of health" still consists of a committee of the Common Council; and although a city ordinance requires the Board of Aldermen to appoint a port physician every year, there is no such officer, and therefore no one responsible for the discharge of any duties or emergencies at all times liable to arise in the commerce of the port, to protect the city from the importation of disease.

RICHMOND, VA., Annual Report of Board of Health, 1883.—*Population* by census taken by public authorities in April, 1883, 70,945. White, 39,582; colored, 31,363. *Births* registered, 1,939. White, 1,002; colored, 937. Still births, 164; white, 68; colored, 106. These statistics are confessedly incomplete. *Marriages*, 670. White, 355; colored, 315. *Deaths*, 1,839. White, 777; colored, 1,062. Rate of mortality, 25.90. White, 19 64; colored, 33.82. Of the whole number of deaths, 386, or about 21 per cent., were caused by

zymotic diseases; 308, or nearly 17 per cent., by tubercular diseases; typhoid fever, 58; diphtheria, 30; whooping cough, 54; diarrhœal diseases, 153; 751 were of children under five years of age.

Acts to regulate the practice of medicine and surgery, promote medical science and protect graves and cemeteries from desecration, and in relation to vaccination, are appended.

INDIANAPOLIS, IND., Tabulated Annual Report for Year ending March 1, 1884.—Total deaths, 1,381; under five years of age, 652. From zymotic diseases, of which 132 were from diphtheria, 480. Ratio of total per 1,000 of population, 15.33; of zymotic diseases, 5.23 per 1,000, more than one-third of the whole, and showing extreme prevalence of preventable causes.

MANSFIELD, O., has for some time been exercised on the question of sewerage, and apparently, after a good deal of inquiry, adopted the *worst* system and *poorest* work available. We extract from the *Shield and Banner* of June 28th the following on the progress of the work:

"As the main sewer is now being constructed, we took occasion to inspect its construction and report progress on this supposed water-tight masterpiece of masonry, which is soon expected to ornament our city.

"In the first place, we noticed that many of the brick used are so soft that already they are beginning to crush with their own weight and can be picked out of the walls with a penknife.

"In the second place, we found many places in the wall with spaces large enough to thrust with freedom the large blade of a good-sized penknife between the bricks, many of which were not mortared between; while in other places the mortar was so soft and porous that a knife could easily be thrust into it.

"In the third place, the insides of the sewer, which our Council and their engineer promised should be plastered smooth with water lime, is not plastered at all.

"In the fourth place, the main wall, which the specifications call for being *nine inches* thick, is but an average of *eight* inches in thickness.

"In the fifth place, we also observed that the fall is so slight that at present, when the water in that sluggish creek is very low, a considerable amount of back water is standing in the

sewer. Will some of our wise fathers explain to us what will be the effect of a flood?

"A few months ago the boast of our Council and their engineer was, that in the bottom of the sewer was to be placed a suitable piece of vitrified pipe. The present sewer, so far as constructed, has a brick bottom and the boasted tile bottom is not to be seen. The legitimate conclusions from these facts are that we are having a badly constructed sewer, through which the liquid sewage can easily percolate into the surrounding soil, and one which will not drain itself even in low water, all of which our taxpayers are respectfully invited to pay for, whether a success or a failure."

BLOOD-POISONING BY RETAINED SECRETIONS.—The Philadelphia *Medical Times* reports that the recent lamented death of Professor A. Wurtz, of Paris, was due to blood-poisoning following voluntary retention of urine for several hours during a somewhat prolonged railway journey, owing to the want of convenient opportunity for evacuation of the bladder.

Several times THE SANITARIAN has had occasion to animadvert upon the danger of the insufficient accommodations for the relief of nature, in public school buildings; that the restraint thereby enforced upon children is a more common cause of illness than medical practitioners, even, are aware of, we think does not admit of question.

The case of Professor Wurtz is suggestive of the restraints common to travel and company, especially with regard to women, and closer inquiry into the causes of many obscure cases of peritonitis from unaccountable blood-poisoning would doubtless shed much light on this dangerously neglected subject.

To travellers in Europe, where passengers are locked in apartment cars, the *Medical Times* suggests the carrying of rubber urinal bottles, to be used in case of need. But more importance should be attached to this subject than has hitherto been, for public assembly places as well as schools. That a great amount of physical suffering is entailed by it, is beyond question.

LOCAL CHOLERA.—A whole family of ten persons, including four boarders, in Yonkers, N. Y., was prostrated with choleraic symptoms, recently, by drinking water obtained from

a cistern within five feet from a privy vault of about the same *water* level.

PARIS SANITARY APPOINTMENTS.—M. Brouardel, President of Consulting Committee on Hygiene; and M. Berthelot, President of Committee on Departmental and Municipal Laboratories in place of M. Wurtz, deceased.—*L'Union Médicale.*

OBITUARY.

WILLIAM FRANCIS SHEEHAN, M.D.

THIS active and unusually promising young physician and sanitarian, died in Rochester, N. Y., July 23, 1884, in the thirtieth year of his age. Dr. Sheehan was born in Limerick, Ireland, on February 12, 1855, and in his youth received a liberal education. In 1874, at the age of nineteen, he came to this country, took up his residence in Rochester, and studied medicine with his uncle, Dr. J. W. Casey. Four years later, in 1877, after taking the courses of the Buffalo Medical College, he graduated with honor, taking a number of prizes, and returned to Rochester, where he entered upon practice. He was at once admitted to membership in the Monroe County Medical Society, which the next year he represented as a delegate in the Central New York Medical Association. In 1880 he was a delegate to the American Medical Association, in 1880 to 1882, secretary of the Monroe County Medical Society. He was also a member of the society committee to prosecute illegal practitioners. In 1877 he was chosen a member of the Rochester Pathological Society, and became in succession its secretary and president. In 1878 he was appointed city physician by the Common Council. In 1880 he was chosen coroner's physician for Monroe County by the Board of Supervisors. In 1882 the Board of Health elected him health officer for the city, and in 1883 he was re-elected. In this office Dr. Sheehan especially distinguished himself by close attention to all its duties, and by the able and successful manner in which he investigated and treated all matters pertaining to the sanitary condition of the city. His retirement from it in the spring of 1884 was cause for regret by all who were familiar

with his work. In 1883 he was elected a member of the American Public Health Association, and in 1884 was a delegate to the Medical Society of the State of New York. He was the author of several valuable papers on medical and sanitary subjects, and a contributor to THE SANITARIAN.

On April 20, 1880, Dr. Sheehan married Miss Katie L. Kramer, daughter of Mathias Kramer, a well-known citizen of Rochester. The widow and an infant son survive.

As a thoroughly courteous and congenial friend and associate, he was endeared to all who knew him ; and in his death society, the profession to which he belonged, and a large circle of friends will cherish the memory of a faithful and energetic public servant, a devoted and skilful physician, and a dear companion.

THE S. D. GROSS PROFESSORSHIP OF PATHOLOGICAL ANATOMY.—American surgery has had no better exponent than SAMUEL D. GROSS, none so honored abroad and at home by institutions of learning, none more revered by his associates and his pupils. His long and brilliant professional career deserves the perpetuation of his name in close association with medical tuition. In furtherance of this object, the Alumni Association of Jefferson Medical College has inaugurated a movement to secure, in some medical school, the endowment of a *memorial professorship*, to be designated THE S. D. GROSS PROFESSORSHIP OF PATHOLOGICAL ANATOMY. The profession at large, the personal friends of the late Professor Gross, and others interested in elevating the standard of medical education, are cordially invited by the undersigned to participate in this graceful recognition of conduct and services which have largely helped to establish the high standard of excellence to which surgery has attained throughout the United States, and served so much to dignify the repute of American medicine. Contributions may be sent to Dr. R. J. Dunglison, treasurer, Lock Box 1274, Philadelphia Post-Office, Pa., and will be acknowledged in the columns of the *Medical News*, of Philadelphia.

D. HAYS AGNEW, M.D., *Chairman.*
J. M. BARTON, M.D., *Secretary.*

1344 *Spruce Street, Philadelphia.*

MORTALITY STATISTICS IN THE UNITED STATES.

FOUR WEEKS, ENDING JUNE 28, 1884. Correspondents under this head are requested to send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping Cough.	Fever.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
†Burlington, Vt., 11,364	17	6	4	..	..	..	..	2	..	..	17.8
Boston, Mass., 427,940	644	200	192	30	11	1	11	7	..	18	19.5
Lowell, Mass., 68,500	85	33	10	1	5	7	..	2	..	4	16.1
Lynn, Mass., 38,284	41	5	12	2	..	..	..	2	..	..	13.8
*Somerville, Mass., 28,663	30	9	10	1	..	..	1	..	..	1	13.5
*Worcester, Mass., 58,295	49	19	14	2	..	..	..	1	..	3	16.1
†Providence, R. I., 120,000	145	32	35	1	4	1	..	3	..	..	14.5
†New Haven, Ct., 75,000	106	24	24	2	4	..	..	3	..	8	16.6
New York, N. Y., 1,356,958	2,656	1,221	649	126	49	109	24	42	..	304	24.7
Brooklyn, N. Y., 624,118	995	430	270	30	18	10	18	18	..	138	20.1
†Rochester, N. Y., 105,000	126	26	29	5	..	..	..	2	..	2	15.4
Albany, N. Y., 97,344	154	45	39	4	5	1	4	1	..	11	20.5
†Auburn, N. Y., 25,000	19	7	7	..	1	..	..	..	..	..	36.2
Yonkers, N. Y., 21,000	23	9	3	..	..	..	..	..	..	3	13.5
West Troy, N. Y., 13,000	28	9	6	3	..	..	1	1	..	2	28.0
Hudson Co., N. J., 209,000	343	135	74	6	8	1	..	8	..	33	21.4
§Paterson, N. J., 57,000	93	28	29	..	3	1	..	6	..	..	19.5
*Philadelphia, Pa., 927,995	1,130	457	222	28	42	10	6	31	4	86	21.4
Pittsburgh, Pa., 180,000	289	146	58	24	5	14	4	3	5	55	20.8
Erie, Pa., 36,678	...	...	..	..	..	..	..	..	..	..	....
Wilmington, Del., 51,500	78	28	12	2	4	..	..	4	..	8	19.6
Cincinnati, O., 280,000	454	199	79	10	6	..	5	8	..	61	21.1
Cleveland, O., 200,429	215	91	35	6	..	6	2	17	..	12	13.7
†Toledo, O., 52,000	66	23	12	..	..	..	1	4	..	4	15.0
Detroit, Mich., 140,000	215	96	35	28	3	7	1	1	..	7	20.8
Evansville, Ind., 40,000	63	39	14	..	..	3	2	4	..	15	20.4
Rock Island, Ill., 11,650	10	5	3	..	..	..	..	..	..	1	11.1
Chicago, Ill., 580,000	869	485	140	42	23	78	9	26	..	63	20.1
†St. Louis, Mo., 400,000	693	358	140	20	5	5	3	24	..	122	20.8
Milwaukee, Wis., 145,000	205	61	37	7	7	3	2	2	..	7	14.3
Omaha, Neb., 50,000	...	...	..	..	..	..	..	..	..	..	....
Salt Lake City, Utah, 22,000	24	7	2	4	..	..	..	..	..	..	14.1
San Francisco, Cal., 235,000	369	98	78	1	..	2	1	13	..	7	21.3
Minneapolis, Minn., 100,000	...	...	..	..	..	..	..	..	..	..	....
†St. Paul, Minn., 100,000	120	70	33	5	2	..	3	3	..	12	14.3
Baltimore, Md., 408,520	680	372	91	13	14	5	7	17	..	143	21.5
Dist. of Columbia, 145,010	195	111	38	7	6	3	2	3	..	1	17.5
†Richmond, Va., 73,400	195	102	27	..	..	..	..	21	..	52	31.8
Lynchburg, Va., 23,000	47	23	3	..	..	1	..	2	..	15	26.6
New Orleans, La., 234,000	673	298	93	11	1	17	7	31	24	95	37.3
†Nashville, Tenn., 50,000	99	43	19	1	..	..	..	4	2	1	21.3
†Mobile, Ala., 31,000	94	39	20	..	..	1	3	4	..	5	33.7
Jacksonville, Fla., 10,000	...	...	..	..	..	..	..	..	..	..	....
†Grand Rapids, Mich., 42,000	21	7	7	1	..	..	..	1	..	1	6.0
†Lansing, Mich., 8,319	10	3	2	..	..	..	..	..	..	..	12.5

* 3 weeks; † Month of June; § Month of May.

MORTALITY STATISTICS ABROAD.

FOUR WEEKS, ENDING MAY 31, 1884.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping Cough.	Typhoid and Typhus Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,019,361	6,025	1,336	959	117	109	325	392	48	102	63	19.5
Liverpool, 573,202	1,047	245	..	2	13	61	85	19	12	17	23.8
Glasgow, 517,941	1,053	210	229	15	26	15	68	12	2	18	26.4
Birmingham, 421,258	689	175	..	2	5	40	26	1	..	12	21.3
†Dublin, 351,014	534	95	84	14	17	4	4	9	..	4	26.3
Manchester, 338,296	665	147	..	1	18	15	25	3	..	4	25.6
Leeds, 327,324	584	145	..	4	29	26	11	9	..	7	23.2
Sheffield, 300,563	477	99	..	..	32	..	6	8	7	3	20 7
Edinburgh, 246,703	426	80	69	10	4	6	45	13	..	12	22.9
†Belfast, 216,622	286	39	84	1	8	1	9	7	..	6	22.8
Bristol, 215,457	276	78	..	..	7	..	6	5	..	5	16.4
Bradford, 209,564	328	75	..	1	2	10	1	2	..	6	20.4
Hull, 181.225	250	60	..	..	2	1	5	4	3	6	18.0
New Castle, 151,325	245	52	..	1	11	..	7	1	1	2	21.1
§Havre, 105,867	126	20	14	2	3	..	2	4	..	4	30 9
Reims, 93,823	192	44	21	10	..	1	2	2	..	24	26.3
†Nancy, 74,954	131	25	11	..	2	..	..	2	..	3	30.3
Breslau, 290,000	674	220	62	11	1	31	..	4	..	38	25.5
*Brussels, 171,293	418	89	54	6	2	1	5	5	21	41	25.1
Cologne, 150,513	331	112	43	4	1	1	14	2	..	26	29.1
†Christiana, 122,000	118	26	22	4	6	..	2	..	..	5	16.3
FOUR WEEKS, ENDING May 24, 1884.											
Frankfort, 145,100	252	76	26	5	1	..	..	4	..	13	25.0
Hanover, 131,200	220	52	28	9	1	..	..	3	..	3	21.8
Bremen, 119,561	203	55	26	3	5	2	4	1	1	4	25.0
Dantzic, 116,162	219	85	10	4	4	..	3	3	..	18	24.4
Stuttgart, 109,937	182	75	20	5	..	2	4	2	..	13	21.5
Strassburg, 110,739	256	98	62	4	1	13	2	2	..	34	30.0
Dusseldorf, 105,287	208	88	21	1	1	1	3	1	..	11	25.9
Nuremburg, 105,176	264	85	51	3	1	..	5	2	..	25	32.6
Chemnitz, 102,713	244	113	9	10	..	..	..	2	..	2	28.4
Magdeburg, 105,000	197	61	10	2	2	4	3	2	..	4	24.4
Elberfeld, 101,000	184	31	22	4	9	..	1	3	..	6	23.7
Barmen, 100,000	169	42	9	5	2	1	3	3	..	12	21.9
Altona, 97,000	199	52	23	6	2	1	1	2	..	9	26.6
Aix-la-Chapelle, 89,116	170	54	25	..	..	..	1	1	..	14	24.8
Mayence, 64,120	123	35	20	2	1	..	..	..	..	7	24.9
Amsterdam, 350,202	739	..	..	52	15	8	5	7	2	..	25.6
Rotterdam, 166,001	464	..	..	6	5	62	3	3	..	5	36.8
The Hague, 131,417	257	..	..	10	..	10	1	..	..	1	25.4
Lyons, 376,613	719	..	26	9	5	14	5	10	39	15	24.8
Berlin, 1,225,065	2,308	787	137	166	28	12	41	10	2	186	24.4
Hamburg, 486,678	1,001	331	126	35	12	7	19	8	..	59	26.9
Dresden, 236,000	509	149	38	33	7	1	9	3	..	18	28.0
Munich, 240,000	626	243	47	16	3	4	14	..	..	85	33.9
Leipzig, 164,636	347	120	30	27	8	3	4	1	..	12	27.4
Königsburg, 154,000	349	134	38	15	14	..	3	4	..	32	29.3
Bucharest, 200,000	429	117	78	16	7	5	..	13	..	24	27.8
Paris, 2,239,928	4,563	590	480	197	14	173	41	157	8	231	26.6
Calcutta, 433,219	..	..	..	..	..	..	..	..	..	..	..

* Five weeks; †3 weeks; §2 weeks.

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH ENDING JUNE 30, 1884.

	Vessels.	From.	Passengers.	Deaths.	Births.
June	1, C. of Chester,	Liverpool,	822	1	
"	India,	Hamburg,	498	1	
"	2, Westphalia,	"	1,001	1	
"	3, Polaria,	"	1,085	3	1
"	4, Weser,	Bremen,	802	3	
"	6, P. Caland,	Rotterdam,	333		1
"	Nuremberg,	Bremen,	1,056	2	1
"	11, Rhaetia,	Hamburg,	1,183	2	
"	13, Genl. Werder,	Bremen,	544		1
"	Westerland,	Hamburg,	504		1
"	14, Baltic,	Liverpool,	910	1	1
"	Ems,	Bremen,	1,154	1	1
"	Polynesia,	Hamburg,	797	2	
"	15, Oregon,	Liverpool,	553	1	
"	18, Italia,	Genoa,	294		1
"	Devonia,	Glasgow,	646	1	1
"	19, California,	Hamburg,	589	1	
"	Pennland,	Antwerp,	450		1
"	20, Eider,	Bremen,	1,043	2	
"	21, Spain,	Liverpool,	426		1
"	23, Arizona,	"	892		1
"	24, Moravia,	Hamburg,	1,120	1	
"	26, Rhynland,	Antwerp,	482		1
"	27, Republic,	Liverpool,	482	1	
"	28, Elbe,	Bremen,	1,271	1	
			18,937	25	13

DEATH RATES.—Dr. Farr once said that if one could watch the march of 1,000,000 people through life, the following would be observable: Nearly 150,000 would die the first year, 53,000 the second year, 28,000 the third year, and less than 4,000 in the thirteenth year. At the end of forty-five years 500,000 would have died. At the end of sixty years 370,000 would be still living; at the end of eighty years, 97,000; at eighty-five, 31,000; and at ninety-five years there would be 223; at the end of 108 years there will be one survivor.

THE AMERICAN PUBLIC HEALTH ASSOCIATION.—From what we hear in all directions, the prospect of an unusually large attendance at the forthcoming meeting of the American Public Health Association, to be held at St. Louis, October 14–17, is very encouraging. The prevalence of cholera in the south of France and Italy, and its steady progress in the latter country, despite the attempted restrictions of antiquated quarantine practice, has had the effect of increasing attention to unsanitary local conditions in this country, and of bringing into deserved ridicule the ostentatious display of the Marine Hospital Service in its pretended blockade of American ports against the threatened invasion. The utter futility of all such efforts to prevent cholera, has been so abundantly demonstrated in the past, that enlightened health officers everywhere appreciate their folly. The chief subjects for discussion before the Association: The Hygiene of the Habitations of the Poor; Hygiene of Schools; Hygiene of Occupations; Adulteration of Food; Water Pollution; Disposal of Sewage and Refuse; Management of Epidemics; Public Health Service, etc., *all* have bearings on the prevention of cholera, as of other diseases; and at no time since the organization of the Association, has its sphere of usefulness to the public been more auspicious than the present.

Extensive preparations are well-nigh complete for accommodating a larger number than have ever attended any previous meeting of the Association; and, under the direction of Dr. Joseph Speigelhalter, Chairman of the Committee of Arrangements, and his associates, a local interest in its purposes has been awakened in St. Louis, which is in every way calculated to promote the best interest of the Association and to increase its usefulness.

All inquiries of a local character connected with the meeting, should be addressed to Dr. Joseph Speigelhalter, Chairman of Committee of Arrangements, St. Louis, Mo., and all in relation to the general purposes of the Association—of conditions of membership, subjects for consideration, papers to be read, etc., should be addressed to the Secretary: Dr. Irvin A. Watson, Concord, N. H.

LITERARY NOTICES.

1. LESSONS ON THE HUMAN BODY.—An Elementary Treatise upon Physiology, Hygiene and the Effects of Stimulants and Narcotics on the Human System. By Orestes M. Brand, Principal of Grammar and Primary School No. 4, Paterson, N. J. Pp. 255. New York: Leach, Shewell & Sanborn, 1883.

2. HYGIENIC PHYSIOLOGY, with Special Reference to the use of Alcoholic Drinks and Narcotics. Adapted from the "Fourteen Weeks in Human Physiology." By Joel Dorman Steele, Ph.D. Pp. 270. New York: A. S. Barnes & Company (no date).

3. THE ESSENTIALS OF ANATOMY, PHYSIOLOGY AND HYGIENE.—A Text-Book for Schools and Academies. By Roger S. Tracy, M.D., Sanitary Inspector of the New York City Health Department. Pp. 299. New York: D. Appleton & Company, 1884.

The Legislatures of Michigan, New York, New Jersey, and other States, in obedience to the demands of the prohibitionists, have recently enacted laws making it obligatory to teach, in the public schools, physiology and the effects of stimulants and narcotics upon the human body. When these laws went into effect there were no text-books ready to supply the demand, hence the book-makers and the publishers of school manuals hastily set about to prepare the material to be sold to school boards. Two of the books now under review were no doubt gotten up to take advantage of the law, for they show many evidences of lack of care in their preparation.

While we do not wish to question the utility of trying to teach school-children the effects of alcoholics upon the human system, we do claim that, if this subject is to be added to the already overburdened curriculum of our schools, it should be taught from text-books written by capable and honest authorities, and the matter should be presented in an unbiased way. We are justified in claiming that a treatise on physiology

should be written by one who has had a medical training, or at least who has been a practical student of physiology, and not by one who merely absorbs ideas from other authors. Let us see if these books now under review can be made to agree with our notions.

(1.) First we shall notice Mr. Brand's book. Upon looking over the physiological portion of the work, we are astonished at the number of errors; we note a few. The first illustration in the book—that of the skeleton—would lead us to believe that the spinal column curved outward in the dorsal region; perhaps the figure was taken from the spine of a scholar educated at our modern schools, and who from long constrained positions at a poorly designed desk had contrived to get his bones into this abnormal shape.

We are told (page 8) that nature gives additional strength to a broken bone by forming a ridge of bone at the place where it is fractured; which statement is true of the lower animals and of—poor surgery. On page 37 we learn that bow legs are caused by permitting infants to stand too much; but *rickets* may be blamed more for this by doctors.

Does the coronary artery supply the stomach with blood? This fact was new to us till we read it on page 52; perhaps this newly discovered fact will account for the sympathy between the heart and the stomach.

When in an elementary work we are told that the air is composed of two *fluids*, we wonder what advanced works will teach.

At last we know the cause of "malaria." On page 107 we are informed that it is "caused by spores which float in the air and are absorbed in the lungs and *pores of the skin*. These spores irritate and poison the blood."

The second portion of the book is devoted to the effects of stimulants and narcotics.

We may ask the question: Is the cause of temperance to be advanced by teaching error or even by instructing children on the physiological effects of alcoholics? We think not—certainly not by Mr. Brand's method. The errors in this part of the book are as numerous as in the first. Thus we are informed (page 183) that alcohol, when taken internally, dissolves the coloring matter of the blood-corpuscles and also changes

their shape. "The loss of strength in the corpuscles is indicated by *black specks of fatty matter*, which, in all cases of disorder in the blood, are found in great numbers." And, on page 186, that as alcohol is used by physicians to preserve brains and other organs *post-mortem* and that it hardens them, its effect is just the same upon the living brain when this same alcohol is used to excess. Our own experience teaches us that a drunkard's brain is a trifle softer and not harder than one removed from a person dead of some other disease.

A chapter is devoted to opium, one to chloral, and another to tobacco, and we wonder why ether, Indian hemp, hyoscyamus, and other narcotics are left out.

This book is inaccurate and unfit for its intended purpose.

(2.) Steele's "Fourteen Weeks in Physiology" is one of a popular series and has an extended sale, but the present edition is published with the idea of teaching prohibition rather than physiology, hence the errors in the part relating to alcohol overshadow the truths taught in the first part. If the publishers had been wise they would have allowed the book to retain its original form, for it was a treatise of considerable merit before being marred by the careless editor.

The purely physiological portion of this book is fairly well written and the facts plainly stated; the illustrations, for the most part borrowed from standard works on physiology and anatomy, are in the main accurate and well engraved. The only two engravings we would condemn are figures 45 and 47; in both of which the position of the stomach is not correctly represented. In recent investigations it has been proved that the cardiac and pyloric ends of the stomach are nearly on a vertical line, and not upon a horizontal plane, as represented in all *amateur* books on physiology and in most professional ones.

The description and treatment of diseases interpolated in various parts of the book are out of place—even if they were accurate, which they are not. Thus, a dislocation is said to be "produced by the rupture of the tissues of the joint" (page 24). Gout is described as "an acute pain located chiefly in the small joints of the foot . . . generally brought on by high living" (page 43).

In the treatment of rheumatism it is stated that "the chief

danger to be feared is the possibility of its going to the heart. Any *violent* remedy, therefore, which would throw it (the disease) from the surface is to be avoided" (page 44).

The author says, under treatment for diarrhœa and cholera infantum, that "laudanum should *rarely* be given to an infant, except by a physician's orders." If we should substitute *never* for *rarely* the advice would be safer. He also recommends as a dose for an adult thirty to forty drops of laudanum, which certainly does not agree with his condemnation of opium written in another part of the book.

But we must leave the physiological part of the book and look at that devoted to alcoholic drinks and narcotics. We remarked in the first part of this review that this and the other book were evidently gotten up to please the prohibitionists; this remark is certainly true of this book, for upon its title-page we are told that it was edited and endorsed by the "Department of Scientific Temperance Instruction of the Woman's Christian Temperance Union," hence we were not surprised to find that but one side of the alcohol question had been presented to the reader. Not satisfied with a note on alcohol under the description of the circulation, remarks are made under the topics of digestion and the nervous system. The physiological and normal effects of a moderate dose of alcohol are nowhere described, but in each case the toxic or pathological results following the use of large and poisonous quantities are stated. In fact, at page 128, the editor starts out by giving the results of adding a drop of alcohol to the web of a frog's foot under the microscope. The result is summed up by saying that the alcohol kills the tissues in this case, hence "the influence of alcohol upon the human system is similar." "*Alcohol is a poison.*" "A quart drunk at a time would kill a man like a bullet"!! (page 130).

Christison, an authority on medical jurisprudence, relates the case of a man who drank a mixture composed of a quart of beer and a pound of salt: it killed him. Yet no person would claim that salt was a poison, because this was a fatal dose.

On page 132 we are told that alcohol absorbs water from the blood-corpuscles, causing them to harden, change their form, and shrink. Perhaps this action will take place under

the microscope. But does it have this effect in the circulation when taken in moderate quantities?

Not satisfied with making these doubtful statements, the editor has depicted what are supposed to be the effects of alcohol upon the stomach in a highly colored print. In this picture we are led to believe that we are looking at pieces of the mucous membrane of the stomach. One section is marked "moderate drinking," another "a drunkard's stomach," another "after a debauch," a fourth "death by delirium tremens," while a fifth sketch claims to represent "the cancerous stomach," the bearing of which on the alcohol question we fail to see. We venture to say that these pictures represent nothing that man has ever seen either in a healthy or pathological stomach. They are simply atrocious.

It is hardly necessary to refer to the stand always taken by THE SANITARIAN on the question of temperance in the use of drink as well as food, and the readers of its pages have ample proof that it has always endeavored to state the alcohol question honestly and candidly. We venture to say this, for fear that we may be accused of bias against this work of temperance reform. The book under review will do more harm to the cause of temperance than any yet printed, and we would suggest that if the cause is to be advanced, it will be by teaching truth, not error, as is done in this book. That portion of it pretending to teach the effects of stimulants and narcotics should not be used in any school-room; it is unfit for the purpose for which it was printed.

Before closing we would call attention to a statement made by the author, when treating of disinfectants, page 238. It is said that "one-half an ounce of permanganate of potash in a pail of water is excellent to wash infected bedding in." It is not, as it will do no good and will ruin the bedding.

"Ill odors in the sick-room will be instantly removed by evaporating a few drops of carbolic acid." Carbolic acid will do no such thing, unless used in quantities sufficient to remove the patient also.

(3.) We confess that we turned to Dr. Tracy's book with the hope that the criticism applicable to the others would not be necessary. And we based our hope on the fact that the doctor was a physician in practice, and from his long connection with

the New York Health Department he had been in a position to make a practical study of hygiene.

To a medical student preparing for examination, and wishing to cover the ground rapidly, to advanced students in colleges and academies, and to scholars receiving instruction in the popular classes for giving "first aid to the injured," this book of Dr. Tracy's will be a valuable guide, but it is too scientific and didactic for students in grammar schools.

The illustrations, being reproduced from standard authorities, are excellent and well engraved. The mistake is made, however, of giving the stomach a false position, in figures 22, 25, and 26, the long diameter being placed in too horizontal a direction.

Those portions of the treatise relating to hygiene and the care of the health are well and carefully written, and the author is cautious about saying anything about diseases and their treatment.

Remarks on what to eat, how to eat, bathing, clothing, and the like, are of value. The situation of the main blood-vessels is plainly depicted, and clear instructions are given as to the arrest of hemorrhage. The resuscitation of the drowned and those overcome with gas is explained.

We regret that the book is a trifle marred by the doctor giving only one side of the alcohol question; he has, however, disposed of it in about two pages, and the writing is not tinctured with bigotry and dishonesty. He states that alcohol is a poison, and then goes on to describe the effects on a person taking "so much that he feels the effects of it." He sums up by saying that alcohol is particularly injurious to young persons, as it retards growth and stunts both body and mind; in which we agree with him.

He is to be thanked for leaving out long descriptions of the effects of opium, chloral, bromide of potash, and other drugs, for we are fully persuaded that accounts of these narcotics instead of checking their use lead only to the taking of them, first out of mere curiosity, then from habit.

We hope soon to see a treatise on physiology written for youths and younger students, and one that will give an unprejudiced acount of the rôle that alcohol plays in our every-day life. N.

A STUDY OF HUMAN GROWTH SECURED FROM THE CLASS OF 1884, IN AMHERST COLLEGE, MASSACHUSETTS, DURING JUNIOR AND SENIOR YEARS.—An exceedingly awkward leaflet, with statement on one side and a table on the other. "The data are all expressed in millimetres, except weight, which is in kilogrammes, and strength, which is an arbitrary datum constructed by multiplying the weight of the body into the indications of strength known as 'chest tests' and added to the tests of the 'back, legs, forearms, and lungs.'"

By which it appears that the average *weight* of the whole number taken in February, 1882, was 60.5; in February, 1884, 62.4; difference in inches, 4½ lbs.; largest individual measure, 82.5; smallest individual measure, 50.5; largest individual increase in two years, 15 lbs. Average *height*, 1882, 1.71; 1884, 1.72; difference ½ inch; largest measure, 1.86; smallest, 1.53; largest increase, 1¼ inch. *Girth:* head, average, 1882, 568; 1884, 578; difference, ⅝ inch; largest, 615; smallest, 541; largest increase, 1 inch. *Chest* (full): average, in 1882, 924; 1884, 932; difference, ½ inch; largest measure, 1.01; smallest, 8.40; largest increase, 2½ inches. *Belly:* average, in 1882, 710; 1884, 739; difference, ¼ inch; largest, 865; smallest, 670; largest increase, 3 inches. *Breadth:* head, average, in 1882, 154; 1884, 154; difference, 0; largest, 170; smallest, 143; largest increase, ¼ inch. *Shoulders:* average, in 1882, 426; 1884, 437; difference, ½ inch; largest, 488; smallest, 411; largest increase, 3 inches. *Waist:* average, in 1882, 252; 1884, 257; difference, ½ inch; largest, 293; smallest, 230; largest increase, ¾ inch. *Hips:* average, in 1882, 321; 1884, 327; difference, ½ inch; largest, 379; smallest, 294; largest increase, 1 inch. *Strength:* average, in 1882, 474; 1884, 501; difference, 27 inches; largest, 869; smallest, 316; largest increase, 176.

THE PACIFIC MEDICAL AND SURGICAL JOURNAL.—The editors and proprietors of *The Pacific Medical and Surgical Journal* take pleasure in announcing that they have made arrangements with Dr. Whitwell, the editor and proprietor of the *Western Lancet*, to unite the two journals under joint charge. For some years past, the junior editor of the *Journal* has been unable, on account of professional and college duties, to render any material aid, so that the burden of the *Journal* has fallen

almost entirely on the senior editor. For this reason the junior editor withdraws in favor of Dr. Whitwell, who will assist in the editorial department, besides assuming the principal charge of the business management. Dr. Whitwell is a graduate of Harvard and is well known as a scholar and an able writer. The new arrangement will not only increase the force employed in preparing and improving the contents, but will also secure a more punctual issue of the work.

The *Journal* will in future contain about one-fifth more reading matter than hitherto, and the subscription price will be reduced to $2.50 per annum *to all subscribers paying in advance.*

AUSCULTATION, PERCUSSION, AND URINALYSIS: An Epitome of the Physical Signs of the Diseases of the Heart, Lungs, Liver, and Kidneys. Edited by C. Henri Leonard, M.A., M.D., Professor of the Medical and Surgical Diseases of Women, and Clinical Gynæcology, Michigan College of Medicine. Fully illustrated; cloth, 16mo, 166 pages, post-paid, $1. Detroit, Mich., 1884: The Illustrated Medical Journal Co., publishers.

This is a particularly useful manual for the medical student or young practitioner, and an excellent remembrancer for those who are older—when crowded for time.

COTTAGES; or, Hints on Economical Building. Containing 24 plans of Medium and Low-cost Houses, contributed by different New York Architects. Together with descriptive letterpress, giving Practical Suggestions for Cottage Building. Compiled and edited by A. W. Brunner, architect. To which is added a chapter on Water Supply, Drainage, Sewerage, Heating and Ventilation, and other Sanitary Questions relating to Country Houses. By William Paul Gerhard, C.E. 8vo, pp. 70. Illustrated. Price, $1. New York: William T. Comstock.

This very full title-page is abundantly suggestive of the utility of the work to all who are about to build a cottage, and would profit by picturesque examples.

THE FALLACIES IN "PROGRESS AND POVERTY," in Henry Dunning Macleod's "Economics," and in "Social Problems," with the Ethics of Protection and Free Trade, and the Industrial

Problem considered *a priori.* By William Hanson. Extra cloth, $1. New York: Fowler & Wells Co.

This is a bold attack on the leading points and arguments made by Mr. Henry George, in his well-known "Progress and Poverty," and "Social Problems." Mr. Hanson is no less radical than Mr. George, but he takes very different views on several subjects and forcibly presents them. For instance, he analyzes Mr. George's theory of interest, and "Law of Rent," and also his remedy for landlordism, and points out their nn-soundness. The same vigorous handling is marked in his consideration of the work of Mr. Henry Dunning Macleod, "Economics," a powerful treatise in itself, but shown to be based upon assumptions that are unscientific. The work is written for the people, from the point of view of the practical man and Christian philosopher who is consciously radical, but seeks to make his every proposition for social reform based upon justice, and responsive to the simple demands of humanity.

EDUCATION, July–August, 1884, is embellished with portrait of Margaret Fuller, with an interesting sketch of her life. The leading papers of the number are: "Order of Scientific Study," William Morton Payne; "Historic Illustrations of Superior Teaching," J. A. Reinhardt, Ph.D.; "Origin of the First German Universities," G. G. Bush, Ph.D.; "Manual Labor Training in the Public Schools," C. O. Thompson, Ph.D.; "Public Press and Personal Rights," John Bascom, M.D.; "The New Education," D. L. Kiehle, A.M.; "The Sunday-school a True Nursery of the Church;" "Teaching History," J. M. Greenwood; "Woman: Her Moral and Political Influence," Sr. Viscount de Campo-Grande, translated by Mr. Thomas R. Nickerson. Boston: New England Publishing Company.

MALARIA AND MALARIAL DISEASES. By George M. Sternberg, M.D., F.R.M.S., Major and Surgeon U.S.A.; Member of the Biological Society of Washington; Late Member of the Havana Yellow Fever Commission of the National Board of Health; Corresponding Member of the Epidemiological Society of London, etc. 8vo., pp. 337. New York: William Wood & Co.

This work, the July number of "Wood's Library of Standard Medical Authors," 1884, very completely sums up all that

is known of the etiology of the diseases of which it treats, clearly defines the differential diagnoses of the different forms in which these diseases appear, and describes the most approved modes of prophylaxis and treatment; is, in short, an unusually valuable condensation of practical knowledge, useful to every medical practitioner.

NEWSPAPERS AND PERIODICALS.—*The American Newspaper Directory* of Messrs. George P. Rowell & Co., for 1884, shows that the number of newspapers and periodicals of all kinds at present issued in the United States and Canada reaches a grand total of 13,402. This is a net gain of precisely 1,600 during the last twelve months, and exhibits an increase of 5,618 over the total number published just ten years since. The increase in 1874 over the total for 1873 was 493. During the past year the dailies have increased from 1,138 to 1,254; the weeklies from 9,062 to 10,028, and the monthlies from 1,091 to 1,499. The greatest increase is in the Western States. Illinois, for instance, now shows 1,009 papers in place of last year's total of 904, while Missouri issues 604 instead of the 523 reported in 1883. Other leading Western States also exhibit a great percentage of increase. The total number of papers in New York State is 1,523 against 1,399 in 1883. Canada has shared in the general increase.

HOW TO DISCONTINUE A JOURNAL.—The following from an exchange fully and freely expresses right views on this subject: "You have undoubted right to stop a paper when you feel disposed, *upon the payment of all arrearages.* Do not hesitate to do so on account of tenderness for the editor. When you discontinue a paper, do so manfully; don't throw it back to the postmaster and say, 'I don't want it any longer!' and have 'refused' written on the margin, and have the paper returned to the editor. No gentleman ever stopped his paper in that way, no matter if his head is covered with gray hairs that should be honorable. If you do not longer wish to receive a paper, write a note to the editor, like a man, saying so; and be sure that arrearages are all paid. This advice is according to law and equity." This is published as a guide to the reader when he wishes to discontinue other journals; of course no one ever discontinues *this journal.—Gaillard's Med. Journal.*

THE DIET QUESTION. Giving the Reason Why, from "Health in the Household," by Mrs. Susanna W. Dodds, M.D. 12mo, paper, 25 cents. Fowler & Wells Co., Publishers, 753 Broadway, New York City.

This is an appendix to "Health in the Household," noticed in the preceding volume of THE SANITARIAN, p. 185. It is of the same character: contains a little truth vitiated with an overwhelming amount of error, vouched for by numerous heterogeneous extracts from a variety of sources, in an illogical effort to support theories and opinions which have no foundation in the truths of physiology and hygiene.

SIXTIETH ANNUAL REPORT OF THE OFFICERS OF THE RETREAT FOR THE INSANE AT HARTFORD, CONN., APRIL, 1884.—During the year just ended there were 97 admissions, 89 discharges, and 18 deaths. The whole number under treatment was 223, being 23 in excess of the previous year. During the sixty years since this Retreat was opened, there have been admitted 6,488 cases. Of this number 2,890 have recovered, 1,661 have improved, 1,020 have been discharged in a condition not improved, and 793 have died. A percentage, of recoveries, 44+; of improved, 25+; of those remaining stationary, 15+; and of those dying, 12+.

SMITHSONIAN INSTITUTION: Annual Report of the Board of Regents, showing the operations, expenditures, and condition of the Institution for the year 1882. 8vo, pp. 875, with numerous cuts and diagrams.

The report of the Secretary, Professor Baird, which occupies the first fifty-six pages of the volume, gives a concise account of the work of the Institution, and contributions to its stock of knowledge for the year. This is followed by correspondence and report on the operation of exchanges. G. Brown Goode, Assistant Director of the United States National Museum, reports upon the reorganization of the Museum, and the progress made in the improvement of its several departments. The General Appendix includes reports on the progress of Astronomy, by Prof. E. S. Holden; Geology, by Prof. T. Sterry Hunt; Meteorology, by Cleveland Abbe; Physics,

by Prof. George F. Baker; Chemistry, by Prof. H. C. Bolton; Mineralogy, by Prof. E. S. Dana; Botany, by Prof. W. C. Farlow; Zoology, by Prof. Theodore Gill; Anthropology, by Prof. Otis T. Mason. Papers relating to Anthropology are contributed: On the Guatuso Indians of Costa Rica, by Don Leon Fernandez and I. F. Bransford; Ancient Remains of White River Cañon, by R. T. Bron; Mounds in Henry County, Ia., by George C. Van Allen; Mounds in Carroll County, Ill., by James M. Williamson; Mounds of the Mississippi Bottom, Illinois, by William McAdams, Jr.; Aboriginal Remains, near Naples, Ill., by John C. Henderson; The Glidwell Mound, Franklin County, Ill., and Remains on White Water River, Ind., by Dr. G. W. Hornsher; Signal Mounds of Butler County, O., and Remains on Blennerhassett's Island, Ohio River, by I. P. MacLean; Aboriginal Structures in Carroll County, Tenn., by James M. Noll; Mounds in Putnam County, Ga., by Benjamin W. Kent; Prehistoric Remains in Florida, and Gold, Silver, and other Ornaments found in Florida, by J. Francis Le Barow, U. S. Engineer; Shell Heaps of Charlotte Harbor, Fla., by Dr. M. H. Simons, U.S.N.; Antiquities in Washington County, Md., by John P. Smith; Shell Heaps near Provincetown, Mass., by H. E. Chase; Report on Explorations in Central America, in 1881, by Dr. J. F. Bransford, U.S.N.; and Abstracts from Anthropological Correspondence, Edited by Otis T. Mason.

MEDICAL SOCIETY OF THE STATE OF TENNESSEE—Transactions, 1884.—A pamphlet of 140 pages, 8vo. The annual address of A. B. Tadlock, A.M., M.D., President, is an urgent statement of the rights of medical men to regulate medical matters, and the strength of union for the promotion of the best interests of the profession against political chicanery and quackish clap-trap under whatever disguise they may appear. Following this are the brief papers on subjects pertaining to practical medicine and surgery, one on the "Study of Vital Statistics of Small-pox in Chattanooga," and one on "Hygiene of the Eyes." The Constitution and By-Laws of the Society, including the Code of Medical Ethics of the American Medical Association, and Catalogue of Members, are appended.

THE SANITARIAN.

SEPTEMBER, 1884.

NUMBER 178.

VENTILATION AND WARMING.

AMONG the controllable causes of ill-health in temperate and cold climates, an excessively variable or foul indoor atmosphere, due to defects in the modes of ventilation and warming, is among the most prolific. And it may be accepted as a general truth, that no system of warming inhabited buildings which does not include arrangements for effectual ventilation should be adopted; hence the necessity of considering these subjects under one head.

The air, in a state of purity, mainly consists of two sorts of gases—oxygen and nitrogen—in the proportion of one part of the former, or about 21 per cent., to four parts of the latter, or about 79 per cent.; of carbonic acid, about four parts in every ten thousand, and watery vapor in variable amount—rarely more than one-sixtieth, and rarely less than one-two-hundredth of the whole bulk. The practical maintenance of these proportions of the atmospheric constituents should be the primary object of all means of ventilation and warming.

Science has pretty accurately determined that for a healthy adult, the average amount of air drawn into the lungs and discharged therefrom, at each respiratory act, is about 25 cubic inches; that the lungs, after once being inflated by the first breath, are never thereafter wholly empty of air during life; that the average capacity of the lungs of an adult is about 200 cubic

inches; that the amount of residuary air—that which is habitually retained in the lungs—continually transferring its oxygen *into* the blood, and receiving in exchange therefor carbonic acid and other effete products *from* the blood, is, alternately, 200 and 175 cubic inches, with every inspiration and expiration respectively.

The whole quantity of air actually respired by a healthy adult in twenty-four hours is about 400 cubic feet. This contains, when once passed through the lungs, about *five and a half per cent.*, or *one hundred times more* carbonic acid than it did before it was respired, and is saturated with watery vapor, no matter how dry it may have been when taken into the lungs.

The amount of watery vapor exhaled from the lungs may be estimated at about 200 cubic feet per hour. In 1,000 parts, this consists of water, 907 parts; carbonic acid, 90 parts; and animal matter, 3 parts. In addition, there may be other substances, which have been introduced into the circulation by the process of digestion or otherwise, and exhaled by the lungs, adding to the impurity of confined air.

Moreover, in close and warmed places, there are extraneous poisons: *carbonic oxide*, *sulphuretted* and *carburetted hydrogen*—the common result of imperfect modes of heating and artificial lighting; and *ammonia gas*—the result of putrefying organic matter. These gases are all poisonous, in ever so small quantities, and add to the danger of unventilated places.

CARBONIC ACID.

Carbonic acid is commonly described as not being poisonous, but only an obstructer of respiration. This is an erroneous view, based upon the fact that when pure it is wholly irrespirable, that not a single breath can be taken in it, and the individual subjected to it dies instantly from suffocation.

But Rignault, Bernard, and others have shown that carbonic acid is poisonous in respirable proportions, wherever it is allowed to accumulate in excess of the normal amount in a pure atmosphere, and that it is rapidly fatal when breathed, where the proportion in the air is 8 or 10 per cent. For example: a bird died in two hours and a half in air consisting, in 100 parts, of carbonic acid 9.5, oxygen 28, and nitrogen 62.5; or, in

other words, in an atmosphere containing 9.5 per cent. of carbonic acid, notwithstanding it contained 7 per cent. more oxygen than exists in ordinary air.* And Snow records (in *The Lancet*, April 6, 1839) as the result of his experiments, that in an atmosphere containing 20 per cent. of carbonic acid, the oxygen being in natural proportion, a white mouse died in one hour and a half, and birds in a few minutes. With 12 per cent. of carbonic acid, the oxygen being normal, a sparrow died in two hours and a half. A white mouse recovered after remaining in the atmosphere for ten hours.

The symptoms of carbonic acid poisoning are irritation of the throat, headache, giddiness, singing in the ears, drowsiness, gradual loss of muscular power, irregular action of the heart, hurried respiration, and sometimes vomiting and convulsions, and finally, as these symptoms disappear, coma and death. Few are the teachers in our public schools who have not observed, more or less, these symptoms.

Notwithstanding, as an illustration of the degree of foulness of the air to which schools and public assemblies are exposed, the following extract from the article on "Warming and Ventilation" in "Johnson's Cyclopædia," showing how far below the standard of purity the air is permitted to become in rooms habitually occupied for many hours consecutively by school-children and pleasure-seekers, is a striking example:

	Carbonic Acid.
School-rooms in New York and Boston, mean of 60	15
Worst air in one of the schools	31
A school in Paris	57
Theatres in New York, mean	26
" London, "	15
" Paris, "	33
Worst air in a New York theatre	76
To these may be added—	
Soldiers' barracks	9.5
Air in sick-room	15

Parts in 10,000.

The weight of carbonic acid as compared with the other constituents of the atmosphere is about one-half greater. This

* Forensic Medicine and Toxicology, Woodman & Tidy, p. 480.

fact suggests at first thought, that it ought always to be found in larger proportion near the floors of unventilated buildings than at the ceiling. And upon this error is based the common fallacy of persons unacquainted with the physical properties of gases, in their efforts to ventilate rooms wholly by openings near the floor. Now, the truth is that although carbonic acid is the heaviest gas of the atmosphere, it is equally distributed —it is quite as abundant at the greatest elevation at which the air has ever been examined, and ordinarily at the ceilings of rooms, as it is at the surface. This is due to a natural law of gases, called *gaseous diffusion:* That all gases tend to diffuse themselves through each other.

The law of gaseous diffusion is promoted by the wind, but it operates even in confined places, insomuch that in close, crowded rooms, if they are warmed, carbonic acid, under the influence of warmth, is commonly more abundant at the ceiling than at the floor. If certain liquids of different densities, such as oil and water, are commingled, they separate again when they are at rest. But gases when brought together thoroughly incorporate themselves with each other, and never separate. In grottoes, mines, wells, and crowded unventilated houses and vessels, where carbonic acid is generated and restricted, it accumulates manifold its due proportion in the atmosphere, and to the fatal extent already referred to.

Whenever carbonic acid exists in undue proportion, it may be detected by passing the air which contains it through lime-water. This, when poured two or three times from one vessel into another, in a room surcharged with carbonic acid, becomes almost milk-white.

AIR SPACE.

The first condition of efficient ventilation is air space ; but the amount of space depends upon a variety of circumstances. Hospital conditions, for example, require the largest amount of space, and modern experience has shown that, other things being equal, *no* inclosed space equals plenary exposure. But for various practical purposes the limits of space vary from 300 to 4,000 cubic feet—the smallest proportion being the exaction for lodging-house dormitories, and the largest for hospitals—making due allowance in all cases for space occupied by furniture.

And *no deviation should be made on account of children*, whether in regard to the different members of a family or a school-room. With regard to this point, John Simon, one of the most distinguished sanitary authorities, well observes :

" It is to be desired that laws and regulations as to overcrowding should not proceed on the assumption that children (to any measurable extent) require less breathing space than adults. Against any such assumption two facts have been considered : first, that even healthy children, in proportion to their respective bodily weights, are about twice as powerful as adults in deteriorating the air which they breathe ; secondly, that the children will almost invariably have certain eruptive and other febrile disorders to pass through, from which adult life is comparatively exempt, and in which the requirement of space is greatly increased. And having regard to these two considerations, I think it best that children and adults should be deemed to require equal allowances of air and ventilation." *

Moreover, it should be observed that the mere space allowance should in no case detract from the absolute necessity of means for renewal of the air, and the smaller the space to be ventilated, so much the more certain should be this provision. If 300 feet only be allowed, the air must be changed at least every 20 minutes. To neutralize the deleterious properties ot respired air and replenish it, every person requires 2,000 cubic feet of fresh air hourly, and with less provision than this contamination is sure to follow.

A few years ago, as member of the New York Medico-Legal Society and of a Committee on the Public Schools, and also as member of the Brooklyn Board of Education, and Chairman of its Health Committee, the writer had occasion to personally examine a large proportion of the public schools of New York and Brooklyn.

Of the rooms used for the primary classes, by children for the most part under thirteen years of age—and constituting about three-fourths of the whole public school population—the average capacity per pupil was *less than 70 cubic feet.*

Over 100 rooms were examined, of less than 50 cubic feet ; 26 of less than 30 cubic feet ; and 1 of only 17 cubic feet per pupil !

* Eighth Report of the Medical Officer of the Privy Council.

It seems hardly necessary to observe that there was no extraordinary provision for artificial warmth in these rooms, by which the windows and doors might, as they should have been, open to their fullest capacity for ventilation. School officers or teachers with so little knowlede of or regard for the sanitary requirements of those under their charge as to permit such stifling chambers, are not to be supposed capable of attention to other appointments. Many of these schools were deficient in all that is most essential for the protection of health, and the surroundings were filthy in the extreme.

The Committee of the Medico-Legal Society, after several conferences with the "Health Committee" and President of the New York Board of Education, secured the adoption of a resolution by the Board, requiring, wherever practicable, not less than 70 cubic feet of air space per pupil.

The Brooklyn Board, after two years' contention, adopted the following resolution (in 1878):

"*Resolved*, The seating capacity of all school-houses, school and class rooms of 16 feet height of ceiling, shall be limited to 9 square feet of floor space, and 150 cubic feet of air space for each occupant. . . . In rooms of less than 16 feet height of ceiling, the ratio of floor space shall be proportionally increased."

There is, unfortunately, reason to believe that, limited as this action of the New York and Brooklyn Boards of Education was, it has not been insisted upon; that while there has been *some* improvement in the sanitary condition of the public schools in these cities within the last half dozen years, overcrowding still exists to a dangerous extent.

But it should not be inferred from the foregoing account that the conditions referred to are any worse in New York and Brooklyn school-houses, than they are in other cities. On the contrary, the writer did not limit his inspections to these two cities, but extended them sufficiently to ascertain that in the larger cities of the United States such conditions are general, and in several others the defects are equally as bad as those which have been particularized. They are a prolific source and means of propagating infectious diseases throughout the community.

To permit the passage of 2,000 cubic feet of air hourly in

ordinary atmospheric movement requires an opening of five inches in the square; and in closed rooms *two* such openings, one for inlet of *pure* air, and the other for the passage out of that which is *impure*. It is apparent, therefore, that for a single occupant of a room of 300 cubic feet capacity, requiring a renewal every 20 minutes, three times as much open space is necessary, and special protection from draft, by means of *covering;* for it should be borne in mind that the estimate for dormitory occupancy only means for the night—not more than eight hours—a liberal proportion of the amount (800 cubic feet) deemed to be sufficient for occupancy day and night, and susceptible of efficient ventilation without dangerous draft.

The estimate of 150 cubic feet for each occupant of a school-room is based upon a similar deduction as that for the dormitory. Assuming from two to three hours for a session at most, for confining pupils to a room, making due allowance for recesses and change of place, and the frequent opening of doors, and that at the noon recess (of one hour) the doors and windows are thrown open for complete air flush: efficient ventilation, with corresponding provision for heating, is deemed to be practicable without danger from drafts with 150 cubic feet of air space.

Reference has already been made to the fallacy of the assumption that because carbonic acid is about half as heavy again as the other atmospheric constituents it should be looked for in greatest abundance near the floor. To illustrate the movement of carbonic acid under the influence of warmth, it is only necessary to arrange a wire stand about two feet in height armed with half a dozen pieces of candle three or four inches apart from top to bottom, and having lighted them, cover the whole with a bell-glass. The warmed air, from which the life-sustaining oxygen has been consumed and replaced by an excess of carbonic acid given off in the process of combustion, rises from each burning candle, and accumulates in the top of the glass. This air will neither support combustion nor life, and the result is, one by one the candles are extinguished—beginning at the top, where the carbonic acid first accumulates, and so on down till the whole are extinguished, the lowest one last.

But the tendency of carbonic acid to thoroughly diffuse itself with the other constituents of the atmosphere should not be forgotten, because of its temporary variation of properties under the influence of heat. If when heated above the temperature of the surrounding atmosphere—as when escaping from burning gas or hot surfaces—and rises, it could escape on reaching the ceiling, while fresh air entered at the floor, it would be good riddance; but provision for this without regard to other conditions would be in conflict with efficient warming. For, fresh air introduced at the floor after passing over furnace, stove, or radiator, acquires a higher temperature usually than the carbonic acid—especially that which is given off by respiration—and rises above it, at the top of the room. Consequently, if this air be allowed to escape, instead of diffusing itself throughout the room, the floor would be cold, and effectual distribution and warmth rendered impracticable.

VENTILATION FLUES.

To meet the changes and conditions of artificial temperature, experience shows that escape flues for foul air should be both near the floor and near the ceiling, and flues for entry of fresh air four to five feet above the floor and on opposite sides of the room from the escape flues. When the weather is cold, the escape flues at the top of the room should be closed; when it is warm, open. Those near the floor should be open at all times, and these, the exhaust flues, should be warmed by a gas jet, or a line of steam-pipe, to make them draw the foul air. With the heating so arranged, by steam or hot-water pipes, as to *keep the floor warm*—which is the most healthful of all means of warming—the escape flues for foul air should be wholly confined to a level with the ceiling, connected with a heated flue.

For the fresh-air supply, the source from which it is drawn should always be carefully considered. The air which passes from furnaces into living-rooms should invariably be taken from out of doors, and be conveyed in perfectly clean and smooth air-tight shafts to and around the base of the furnace. Preferably, the inlet of the shaft, or cold-air box, as it is commonly called, should be carried down and curved at a level (of its upper surface) with the bottom and full width of the furnace.

Thus applied, the air is equally distributed for warming and ascent through the hot-air pipes to the apartments to be warmed. On the outside, the cold-air shaft should be turned up several feet from the surface of the ground, and its mouth protected from dust by an air-strainer. A simple but effectual way is to cover the mouth with a wire-cloth, and over this to lay a piece of unglazed cotton wadding. This may be kept in place with a weight made of a few crossings of heavy wire, and the cotton changed whenever it appears to be filled with dust—every few months. And here, too, outside the house, should be placed the diaphragm for regulating the amount of cold-air supply through the flue, and not, as commonly, in the cellar.

The same general conditions apply for the fresh-air supply to the coils for *indirect* steam heating. "Plenum ventilation," that which is applied by the use of machinery to public halls, institutions, etc., differs from that which has now been described only in degree by *forcing* a sufficient quantity of fresh air into the building by machinery.

WARMING.

The different modes of warming may be divided into three classes: Open fireplaces, stoves, including furnaces, and steam and hot water. The most universal of all mistakes in regard to warming in cold climates—no matter what the mode adopted—is to estimate the amount of fuel and heat-producing capacity solely with reference to warming. Ventilation is equally essential—ay, more—and it cannot be effected without expenditure of fuel. And the smaller the space to be warmed—the relative capacity to the number of occupants—the larger the proportion of heat required for ventilation, for the manifest reason that the air has to be changed more frequently.

1. Open fireplaces are only adapted to mild climates. The heated air from the open fireplace or chimney grates is available to the apartment for only about twelve per cent. of the total amount of heat produced; all the rest passes up the chimney. Hence, in cold weather, the amount of heat available from this means, for warming the floors and walls, or reaching the remote corners of rooms, is wholly insufficient. And as Rumford put it, many years ago: "While the draughts chill one

part of the body, the rest is roasted by the fire in the fireplace, and this cannot but be injurious to health."

The special merit of the open fireplace is good ventilation. The heated chimney from its use is the most effectual of all exhaust shafts for carrying off impure air. Some recent inventions in open fireplace grates, by which the grate sets well out into the room and combines with a radiating surface and fresh-air supply at the back, are great improvements in the economy of heat, and fulfil in a remarkable degree the best conditions for ventilation, either alone, when the weather will admit of it, or as adjuncts to furnaces.

2. Close stoves utilize from eighty-five to ninety per cent. of the heat produced, and lose through the smoke-pipe only about as much as the open fireplace saves—ten to fifteen per cent. And herein lies the striking difference between the relative healthiness of the atmosphere heated by a close stove and an open fireplace. The amount of air which passes through a close stove, heated with a brisk fire, is on an average equal to only about one-tenth of the capacity of the room warmed, and consequently such stoves require, if unaided, ten hours to effect a change of atmosphere in every such apartment. Thus stagnant and heated, the air becomes filled with the impurities of respiration and cutaneous transpiration.

Moisture, too, is an important consideration. The air, whether within doors or without, can only contain a certain proportion of moisture to each cubic foot, and no more, according to temperature. At eighty degrees it is capable of containing five times as much as at thirty-two degrees. Hence an atmophere at thirty-two degrees, with its requisite supply of moisture, introduced into a confined place and heated up to eighty degrees, has its capacity for moisture so increased as to dry and wither everything with which it comes in contact: furniture cracks and warps; seams open in the moulding, wainscoting, and doors; plants die; ophthalmia, catarrh, and bronchitis are common family complaints, and consumption is not infrequent.

But this condition of house air is not peculiar to close stoves. *It is equally true of any overheated and confined atmosphere*—no less applicable to steam-radiators than to stoves and hot-air furnaces.

The chief advantage is, that warming the air by means of a close stove is more quickly accomplished, more easily and more economically kept up than by any other means.

Sometimes, by the scorching of dust afloat in the atmosphere, an unpleasant odor is evolved, which is erroneously supposed to be a special indication of impurity, caused by burning the air; it is an indication of excessive heat in the stove. The air cannot be said to burn, in any true sense of the word, for it continues to possess its due proportion of elementary constituents, notwithstanding such accidents. Such is the close stove and its dangers under the most unfavorable conditions.

But stoves have been greatly improved in recent years. "Open fire-stoves" combine the advantages of the open fireplace and the close stove, provide for fresh air and economize heat. The important improvements in stoves of this kind have not only well-nigh supplanted the old open fire-grate in supplying all that was ever claimed for it, but excel it in all the requisites for economy and comfort. These are provided with shafts conveying fresh air from the outside of the house to the bottom of the fire-grate and around a radiating surface of an inner shell.

But the most important condition for the protection of health in stove heat is provision for the removal of impure air. This is a much more difficult task than it is to obtain that which is pure.

The experiments of Pettenkofer have shown that under the common conditions of the atmosphere a very considerable exchange of gases takes place through dry plastered walls, brick, and stone. But the cold felt by proximity to the wall or windows in a warm room is never due to this cause; it is due to the loss of heat by radiation from the body toward a colder surface. Yet every observer is aware of the force with which the outer air presses in through all crevices around doors and windows when great differences exist between the temperature of the out-door and in-door air; and the greater, if the in-door air is provided for means of escape with its impurities. The essentials for healthy stove heat are a brick-lined fire-chamber, *exhaust-flue* for foul air, and provision for fresh-air supply.

A brick lining is requisite for the double purpose of preventing overheating and for retaining heat in the stove. For the supply of moisture the means are simple and easy of control, but often inadequate.

An efficient air-shaft may be fitted to the commonest of close stoves by simply inclosing the smoke-pipe in a jacket—that is, in a pipe of two or three inches greater diameter. This should be braced round the smoke-pipe and perforated by it, leaving about an inch opening all round, and carried down to within six inches of the floor, or resting upon the floor in four prongs, left by cutting out the end in four deep notches. At its entry into the chimney, or in its passage through the roof of a railway car, a perforated collar should separate it from the smoke-pipe.

For a stove with short horizontal smoke-pipe passing through a fireboard, the latter should always be raised about three inches from the hearth. A smoke-pipe thus jacketed or fireboard so raised affords an efficient air-shaft for the escape of foul air.

The introduction of fresh air is a comparatively easy matter. In default of special provision in ordinary dwellings and tenements, or in public institutions and dormitories, a strip of board three inches wide under the window-sash, closely fitted, provides for an inlet between the sash at the middle with a direction to the top of the room, and therefore not likely to subject any one to draught, while it promotes a free circulation of the air in the room.

Hot-air furnaces are simply inclosed stoves placed outside the apartments to be warmed, and usually in cellars or basements of the buildings in which they are used. The manner of warming is virtually the same as by *indirect* steam heat, by the passage of air over the surface of the heated furnace or steam-heated pipes, as the case may be, through flues or pipes provided with registers.

The most essential condition of satisfactory warming by a hot-air furnace is a good chimney draught, which should always be stronger than that of the hot-air pipes through which the warmed air is conveyed into the rooms; and this can be measured by the force with which it passes through the registers. A chimney draught thus regulated effectually removes

all emanations; for if the chimney draught exceeds that of the hot-air pipes, all the gaseous emanations from the inside of the furnace and from crevices, or if the furnace is of cast-iron and overheated, all the gases around it on the outside will be drawn into the chimney.

Closely connected with this requirement for the chimney draught is the regulation apparatus for governing the combustion of fuel, the draught of the furnace. This should all be below the grate; there should be no dampers in the smoke-pipe or chimney, and all joints below and about the grate should be air-tight. The fire-pot should be lined with brick, and entirely within the furnace, but separate from it, so that the fresh air to be warmed cannot come in contact with the fuel chamber. A large heating surface of the furnace is a well-recognized condition of both economy and efficiency, and absolutely essential for effectual ventilation. As a rule, the calculation should be ten square feet of surface to every pound of coal consumed per hour when in active combustion; and the grate area should be about one-fiftieth of that of the heating surface. For the deficiency of heat, or the failure of some of the hot-air pipes in certain winds and weathers in large houses, or for specially exposed rooms, the best addendum is an open fire-grate.

But with a view to the best means of distributing the heat, regulating the temperature and purity of the atmosphere, it is requisite that certain proportions be observed between the size of the shaft or shafts for the inlet of fresh air and the hot-air pipes for the distribution of the warmed air. The area of the smallest part of the inlet (or inlets, for it is sometimes better to have more than one) should be about one-sixth of a square foot for every pound of coal estimated to be burned hourly in cold weather; and to prevent in a measure the inconvenience of one hot-air pipe drawing from another, the collective area of the hot-air pipes should not be more than one-sixth greater than the cold-air inlet. These proportions will admit the hot air at a temperature of about 120° when at zero outside, and the velocity through the registers will not exceed five feet per second.

With these provisions in detail, and those which are to follow with reference to ventilation applicable to all modes of

warming in houses of moderate dimensions, hot-air furnaces may be made to supply the chief advantages of the more expensive methods of steam and hot water.

HEATING BY STEAM AND HOT WATER.—*Steam heat* is that which is accomplished by means of heat generated in the furnace of a boiler, either within or without the building to which it is applied: the heat being expended upon water which is vaporized and the steam generated thereby distributed in small pipes as the medium of imparting the heat. Steam-heating is divisible into two methods: *direct* and *indirect*. The first or direct method corresponds to the heat by stoves; and the indirect corresponds to hot-air furnaces. In the direct method, the heater stands in the room which is to be warmed, and consists of coils of pipe, incased or otherwise, or of ornamental boxes. In the second, or indirect method, the coils or lines of pipe are placed in the basement or cellar, or in flues in the walls, and the fresh air is warmed in the same manner as when it passes over a hot-air furnace. The special advantages of steam heat over stove and furnace heat are the facility with which it may be applied to large buildings; avoidance of the foul gases which may escape from an overheated or imperfectly regulated stove or furnace; and, when the boiler is outside the walls of the building to be heated, freedom from the risk of fire.

Its disadvantages are, for small area, expense in applying and conducting it, the length of time required in getting heat after starting the fire, and troublesome noises in the pipes due to the condensations and expansions of steam from irregularity in the distribution of heat and deviations in the lines of the pipe.

Hot-water heating is effected by the circulation of hot water through a system of pipes so arranged that the water, as it is heated, flows in accordance with the laws of specific gravitation. It may be distributed with the same facility as steam, over any extent of area, and has the advantage of communicating heat immediately that the hot water begins to flow—in much shorter time than is required for converting it into steam—and is wholly free from the noises of steam-heat, which give it a special advantage for hospitals.

Finally, no matter what the system of heating, the impor-

tance of an abundant supply of *clean* fresh air, and exhaust-shafts to carry off foul air, equally applies to all systems.

The air-flues of both sorts should be perfectly smooth and air-tight, and should never form acute angles. Brick, plaster, and cement flues have absorbent surfaces, liable to contamination from any impurity in the air which passes through them, and may become sources of danger. Hence, chimneys which are not also used for smoke-flues are not so good as smoother surfaces, but in any event when used exclusively as exhaust-flues should always be provided with gas-burners. *The size* of the flue for the withdrawal of foul air is an important consideration which should never be omitted.

According to Morin, one of the most distinguished authorities on ventilation and warming, a flue eleven inches square and sixty-six feet high, provided with a seven-feet gas-burner, will withdraw 13,300 cubic feet of air per hour. But a fifty-feet burner in the same shaft will remove only 23,000 cubic feet per hour—so much higher temperature is required to produce the greater velocity. The size of the flue, therefore, should be so proportioned as to produce the necessary ventilation with velocity through it of four or five feet per second. The draught will be in proportion to the square root of the height of the chimney.

A. N. BELL.

INFANT FOODS.—From a lecture by Dr. Skalweit, of Hanover, on "Nourishment with Special Reference to Infants' Foods:" "I have particularly examined the properties of the Anglo-Swiss Condensed Milk Company's milk food and compared it with other foods. While the latter yield a pap more or less thick in consistency, the Anglo-Swiss milk food, when cooked with *the same quantity* of water, yields a liquid of about the consistency of milk, and in which the greater part of the prepared starch is held in solution. Besides, this food is as rich in albumen (or nitrogenous constituents) as any other similar preparation, or even richer, and we cannot hesitate for a moment in recommending this new milk food both from a sanitary and a chemical point of view."

SEWERAGE SYSTEMS AND THE EPURATION OF SEWAGE BY IRRIGATION AND AGRICULTURE.*

By HENY J. BARNES, M.D.

MANY of the cities and towns of Massachusetts, as well as those throughout the country, have in the near future this question to dispose of in a scientific and practical manner. Political economy and the public health demand attention to this subject already in many communities. An epidemic of typhoid fever in a neighboring town would be a very dangerous menace to the health of the citizens of Boston in consequence of the water supply of the latter being the receptacle for the drainage and dejections of the former. A beautiful lake in the vicinity of Boston is made so filthy by a large sewer discharging into it that twice a public cry of reprobation has been raised against it. The valley of one of our large rivers has been rendered almost uninhabitable by the drainage of a large inland city. It is now said that the citizens of Chicago are much of the time drinking their own sewage, as a result of taking water from a lake with which their sewerage system connects; and we may add that the city which is not troubled by its system of drainage is the exception and not the rule.

The effects of pollution by sewage of wells, springs, rivers, and ponds used for domestic purposes, are so generally recognized that no attempt is made to collate the many, many calamities which have befallen cities, towns, villages, and families through ignorance or indifference as to what disposition is made of the refuse matter of dwellings, and we must also acknowledge that a comprehensive system of disposing of sewage must be inaugurated in the near future, both in towns and by every individual hamlet. The present method of gathering in cesspools or subterranean channels, which discharge in a manner to jeopardize health and comfort of ourselves and neigh-

* Read before the Section for Clinical Medicine, Pathology, and Hygiene of the Suffolk District Medical Society, Mass., April 30, 1884.

bors, must be abandoned for a system which shall dispose of and purify the sewage in a practical manner, or we must give up some of our large rivers for sewerage systems, or construct at enormous expense metropolitan systems, both of which have proved unsatisfactory or failures in Europe.

London's metropolitan system, which discharges in the maritime Thames about twenty-one miles below the city, of which so much was expected, and cited as an example Boston might imitate, has proved far from what was anticipated. The sewage, instead of going to sea, or being diluted to an extent which would render it innoxious, is deposited by the tides above and below the mouth of the sewer in such a quantity as to cause a great cry of indignation from the inhabitants living along the banks of the river, and numerous petitions to Parliament asking for relief have been presented.

Torquay and Brighton, draining directly into the sea, have experienced similar results, and their systems are pronounced failures. The once beautiful Bay of Naples is to-day a reeking pool of filth. A recitation of the many examples of pollution of rivers both in Europe and America, and the attendant evils, is unnecessary, but the following list of English cities where the courts have enjoined drainage into rivers suggests what we may anticipate in this country: Bradbury, Blackburn, Chorley, Doncaster, Harrowgate, Leamington, Merthyr-Tydvil, Rugby, Tunbridge Wells, Warwick, Kendal, Birmingham, Bolton le Moor, Bradford, Coventry, Leeds, Halifax, and Rochdale.

In 1870 the Royal Commissioners, reporting on the pollution of the Mersey and the Ribble, stated "that sewage discharged in running water is not materially changed for many hours by oxidation." This they demonstrated by the following experiment: A volume of filtered sewage from a drain in London was mixed with nine parts of pure water. Analysis of this mixture showed it to contain per 100,000 parts, 267 parts of carbonaceous matter and .81 parts of nitrogenous matter. It was exposed each day to light and air, shaken and drawn by small siphons in a manner to cause a fall of over three feet from vessel to vessel. At the end of 96 hours there remained 250 parts of carbonaceous matter and .58 parts of nitrogenous matter, indicating a loss of but 17 parts of carbonaceous matter and .23 parts of nitrogenous matter. At the end of 192 hours

it had lost but 25 per cent. of carbonaceous matter and 33⅓ per cent. of nitrogenous matter. This experiment was made in a temperature of 68° F., and was designed to show the change likely to take place in the current of a river running at the rate of one mile per hour, and carrying 10 per cent. of sewage. They concluded that there was not a river in England long enough to dispose of a moderate amount of sewage through oxidation.

J. Babut du Maris says: "It has been proved that the waters of rivers do not lose a material amount of azote in a run of over three hundred miles. And the Prussian Government has consequently forbidden the pollution of rivers and seaports by the discharge of the detritus of cities."

The effects of imperfect sewerage systems are forcibly portrayed in a paper printed in the *Boston Medical and Surgical Journal* of February 22 and March 1, 1883. In that paper Dr. Morton Prince collates many epidemics of typhoid fever from this cause. He says, "It is estimated that in this State (Massachusetts) alone there are ten thousand cases of typhoid in each year," and every one knows that a large proportion may be fairly charged to defective drainage. How imperfect sewerage causes this disease was well illustrated at Nahant, Mass., in 1881, and thoroughly reported by Mr. Ernest Bowditch. A paragraph from page 246 of the supplementary report of the State Board of Health, 1882–83, would properly introduce the question discussed in this paper, as the successful epuration of sewerage by irrigation and agriculture depends upon where, and to what extent, nature provides in the soil for the elimination of filth. Mr. Bowditch says, after noting the improvement in the sanitary condition of the town the year following the epidemic: "While the conclusions as to soil recovery may be derived from insufficient premises, perhaps calling attention to the subject may lead to the discovery of facts warranting systematic research in this direction that may be of great sanitary value." Dr. Frankland wrote in May, 1881: "There are in nature powerful agents for the destruction of disease. It cannot be doubted; otherwise the human race would long ago have been exterminated. The problem is not entirely solved, but experience seems to demonstrate this action on sewage employed on irrigation, for when known to be infected

by cholera and typhoid fever in England, it has never produced these diseases in the inhabitants living on the sewage farms and consuming the produce."

Many and varied are the systems advocated and methods adopted with the object of disposing of sewage. Surface drainage, cesspools, subterranean drainage, and the pneumatic system of Liernur, which are employed for collecting and discharging into rivers, ponds, bays, oceans, and on the land, are the most common means of distribution. Filtration, precipitation, the employment of chemical agents, irrigation, and agriculture are some of the measures adopted for the purpose of epuration.

CESSPOOLS.

Depositing sewage in cesspools is one of the most common as well as antiquated methods. The cesspools are emptied at intervals varying from one week to five or more years. They involve the concentration of fermentescible matter and the consequent generation of gases dangerous to health, besides the vitiation of subsoil water. The soluble organic matter contained in them is capable of very long journeys under ground, with the loss of coloring matter only, as many analyses have proved. Their use should not be tolerated, except the walls are made impervious to liquids, and they should be emptied at short intervals. A writer on the subject says: "The time is not far distant when they will be pronounced a relic of barbarism."

DOWNWARD INTERMITTENT FILTRATION PRACTISED AT KENDAL, ENGLAND.

The population is about 14,000. There are 450 water-closets connected with the sewers, which discharge 868,000 gallons per day. A reservoir of deposit was first constructed, which overflowed on a farm of about fifteen acres, with the object of utilization by agriculture. The area of the farm proved insufficient to epurate the sewage completely, and five acres of filter beds were added. These, with the farm, suffice to purify the water. In 1875 the products of one-third of the farm, consisting of cabbages, beets, celery, and rhubarb, sold for $500; oats and rye on another third, $375; and on the remaining five acres $225 worth of hay was raised; making a total of $1,100

worth of produce from fifteen acres. The application of the sewage cost $550.

The operation of the same system constructed by I. Bailey Denton, at Abingdon, Great Malvern, and Halstead, England, and at Forfar, Scotland, has proved satisfactory, inasmuch as sufficient matter is eliminated to allow the effluent discharge into neighboring rivers, although it contains a large amount of putrescible matter, as indicated by analyses. It just escapes the ban of the Pollution Act.

THE PNEUMATIC SYSTEM OF LIERNUR

is employed at Amsterdam for a limited number of the inhabitants. The sewer-pipes are made of iron, with air-tight joints. An air-pump makes a vacuum. Closets are opened simultaneously once a day in section after section of the city; the content is drawn to the mouth of the sewer, from which it is carried away in barrels and deposited on the land. Its enormous cost bars its employment where any other system can be used.

UPWARD FILTRATION AT BIRMINGHAM, ENGLAND.

Population about 350,000. Eight thousand water-closets connected with the sewers, which discharged about 14,000,000 gallons per day in the river Tame. An injunction was obtained to prevent the discharge into the river, unless the sewage was first purified. A reservoir of deposit was built, and a system of upward filtration, but complaint of the continued pollution of the river necessitated its abandonment. The city then attempted irrigation and agriculture, but this was also enjoined. Finally, after much delay and litigation, the city bought 120 acres of land, and on the advice of an engineer constructed a new reservoir of deposit, where they treat the sewage with lime. To 13,434,860 gallons is added 13 tons of lime each day. This clarifies the water to a certain extent by causing a deposit of about 300 tons per day, which is carted out and buried on the land.

It has been an easy matter to separate material in suspension from drain-water by filtration, but as this represents only about one-seventh part of the value of sewage for fertilizing purposes, the process, though simple, has never proved re-

munerative, and chemists have been employed to suggest agents which would precipitate the soluble matter, which represents six-sevenths of the value. Lime has been employed at Tottenham, Blackburn, and Leicester, but the Royal Commissioners report of each a failure, inasmuch as the drain-water after being thus treated contains a large amount of putrescible matter.

TREATMENT OF LIME AND CHLORIDE OF IRON AT NORTHAMPTON, ENGLAND.

To 250,000 gallons of sewage is added about 100 quarts of lime and 6 quarts of chloride of iron, which are thoroughly mixed, and afterward passed by upward filtration through a layer of calcinated iron 8 inches thick. The water comes out without color or odor, and is then allowed to flow into the river. At first there was no complaint, notwithstanding the presence of a large amount of putrescible matter, but later the river became offensive, and the court has enjoined the discharge of such water into it.

THE A, B, C METHOD OF SILLAR.

A mixture consisting of 600 parts of alum, 25 parts of burned clay, 1 part of blood, 10 parts of salt, 1,900 parts of clay, 15 parts of animal charcoal, 5 parts of magnesia, 20 parts of wood charcoal, 10 parts of manganate of potash, and 2 parts of calcined magnesia is added to the sewage to be treated in a proportion of about one pound of the mixture to 250 gallons, thoroughly agitated, and then allowed to settle in large reservoirs, which are alternately emptied, and the detritus taken out, dried, and sold as a valuable fertilizer. The residuary water still contains putrescible matter, and notably more ammonia than was in the sewage before being treated.

PRECIPITATION BY CHEMICAL MEANS AT COVENTRY, ENGLAND.

Population, 40,000. Five thousand water-closets connected with the sewers, which discharged 2,289,000 gallons of sewage in the river Sherborne. Complaint and litigation was the result. A reservoir of deposit was constructed, after which the sewage was allowed to filter across a gravel bed three feet

thick. This proved unsatisfactory, as only solid matter was taken out, and the court again interfered with an injunction. A contract was then made with a fertilizer company, which agreed to epurate the sewage for fourteen years at $3,750 per year, the company engaging to erect buildings and machinery, and furnish the necessary tools. An extractor first separates the solid matter. The liquid is then run into caldrons under the first group of buildings. Agitators mix impure sulphate of alumina with it at a boiling temperature. It then passes into a second set of vessels, where milk of lime is added and thoroughly mixed, then discharged alternately into four reservoirs in the open air, which are cleaned every fourth day. The liquid thus treated comes out sufficiently pure, and is allowed to filter over about four acres and finally find its way into the river. Thirty tons of detritus are taken each day from the reservoirs, piled to dry, and subsequently treated by artificial heat. The works are not in operation at night, except the discharge of the sewage on the filter beds. Twenty-two tons of coal, 1 ton of sulphuric acid, 9 tons of sulphate of alumina, and 4 tons of lime are used each week. The company's net loss is about $7,500 each year.*

After long and costly experiments the greatest chemists have declared that in practice the only manner to epurate sewage is to send it on the land, which eliminates the polluting elements and fertilizing matter for the good of vegetation and the soil. Dr. Angus Smith says: "In all cases the best results are obtained by irrigation." And Dr. Carpenter certifies in a notice read at the International Congress in 1881, "the only way ammonia can be eliminated from sewage is by irrigation."

A commission appointed by Parliament, composed of Messrs. Dennison, Frankland, and Morton, reported: "The actual resources of chemistry do not permit the hope that the polluting matter dissolved in sewage can be precipitated and sent away by any appliance of chemical reaction, and unless new chemical laws are discovered it is useless to attempt the employment of chemical agents. Epuration must be confided to Dame Nature."

* Millions of dollars have been expended in France in chemical experiments on sewage, all of which have been condemned.—*J. Babut du Marès.*

At the Women's Prison in Sherborn, Mass., epuration of sewage is attempted by what is known as Colonel Waring's method. Five acres of land are here employed, in the watershed of Lake Cochituate, about two miles from the lake, with which it is connected by a brook, one of the tributaries of Boston's water supply. The sewage is distributed over the land by tile-drains with broken joints laid fourteen inches below the surface, five feet apart. The effluent drainage is provided for by cross-sections of tile laid five feet under ground, which, after collecting the water, discharge in the brook. This system is said by the prison authorities to work satisfactorily.

"The water coming from the ground is as clear as spring-water, and was selected by an expert as such on inspection." This only indicates clarification, and we regret that analyses made were not published, as no one seems to know where they are at the present time. There can be no doubt but the grass, which is the vegetation on the land, takes nourishment from the sewage, for the lines of drain are clearly marked by a better growth directly over them, which does not extend to the intervals between. One of the defects of this system has already been experienced. Insoluble matter has filled the interstices between the tiles and prevented fluids from passing through, necessitating their being taken up and relaid. At a depth of fourteen inches the influence of vegetation and the infusoria must be lost on much of the sewage, which was probably disclosed by the analyses, rendering it desirable that they should be pigeon-holed. (Since writing the preceding a visit to the prison more than confirms the anticipated objection to the system.) And the following analysis, obtained in the office of the State Board of Health, is proof beyond dispute that the system amounts to nothing by way of purifying the sewage, and that it is practically a mammoth cesspool, the contents of which the citizens of Boston must drink:

WOMEN'S PRISON SYSTEM. PARTS PER 100,000.

	Ammonia.	Alb. Ammon.	Chlorine.	Residue.
Supply end ...	.240	.018	9.58	68.5
Flow end	.232	.034	9.22	69.0

The exclusion of air from the sewage of this system keeps it fresh; the nitrogen is in an organic state and consequently of no use to vegetation. A fertilizer should become ammoniacal by decomposition before it is possible of assimilation by plants. Analyses of sewage in Europe reveal the fact that there is no loss of fertilizing material in a closed conduit having a run of seven and one-half miles. And examinations of the soil of sewage farms show that in all instances the sand one foot below the surface is as pure and white as that where irrigation is not practised.

In the Mystic Valley the sewage of tanneries has for several years been pumped by the city of Boston into reservoirs of deposit obviously too small to eliminate even the matter in suspension. From the tank there is an overflow into a shallow ditch several hundred feet long, in which are set several brush dams, after which it discharges into the Mystic Lower Basin. The result of this treatment is to start putrefaction by warmth and free exposure to air, and thus produce a stench which people living in the vicinity claim has greatly reduced the value of real estate. It does not merit extended description, as the effort thus far made merely amounts to a flirtation with the subject.

A few of the farmers living along the Blackstone River are beginning to appreciate the valuable fertilizing material conveyed by the current from Worcester, Mass. One farmer states that his meadow lands, which were practically abandoned, it not paying to harvest the grass, now produce crops which add several hundred dollars a year to the value of his farm. Others are placing obstructions in the river, with the object of turning the water on the land.

During the past ten years sanitarians and engineers have made great progress toward a solution of this question, and it is fair to presume, from the great increase in the number of cities and towns that have adopted irrigation and agriculture as the means of purifying sewage, that this method has proved the most satisfactory. Berlin has two large farms devoted to this object, one of 2,035 acres and another of 1,818 acres. A great many chemical experiments were tried before the adoption of the present system. They proved very expensive, and none purified the water, although many clarified it. Finally,

after experimenting in irrigation and agriculture for eighteen months on a little field of about three hectares (less than seven and one-half acres), such favorable results were realized that this system was adopted for the city, the eminent Virchow working heartily in its favor. At the present time 1,067 acres suffice to purify 15,060,000 gallons per day, the drainage of four-fifths of the city, containing a population of over 600,000. There is some odor at the opening of the large sewer, but in the fields there is no smell, and the sanitary condition is all that could be desired. There never has been any complaint from the numerous adjoining habitations, and the effluent drain-water of the farms is pure and clear, it being impossible to recognize by microscopy or chemistry any influences of the sewage. Vegetables and fruit trees grow luxuriantly on the land, and their roots make a perfect filter. Thirteen and one-quarter tons of hay have been cut per hectare (a little less than two and one-half acres).

Dantzic, situated about three miles from the Baltic, on account of pollution of its harbor at the mouth of the Vistula, constructed a sewer to discharge on a sandy island having little or no soil, where the occasional tufts of grass were frequently covered with sand carried by the wind. As a result, the island is now in a high state of cultivation. In some parts the land rents to peasants at from twenty to thirty dollars per acre. The frosts of winter do not interfere with the successful operation, as the water delivered by the sewer melts the snow and ice, so that it finds its way into the ground quite as well as in summer, and without injury to the slumbering vegetation. Odessa, Breslau, and Florence also have sewage farms. M. A. Durand-Claye, from whose reports this information is derived, says that "in Germany it is admitted without question that municipal healthfulness depends upon three principles: first, the total discharge of water-closets in sewers; second, the distribution of an abundant supply of water in dwellings and frequent flushing of drains; third, the purification of sewage by soil and vegetation."

In England there are two hundred cities and towns disposing of sewage by irrigation and agriculture. On the farms at Edinburgh are located beautiful nurseries for the children of the city. At Lochend, a farm taking sewage from this city

has produced $200 worth of hay per acre. The Metropolitan Sewer Company of London rents land at $100 per acre for grazing. Sixteen acres at Rugby furnish feed for fifty-four head of cattle, and at Aldershot, Branbury, Bedford, Croydon, Norwood, Warwick, and Worthing, the reports in detail show an equally wonderful production from the land treated in this manner.

Leamington, with 26,000 inhabitants, spent $40,000 in chemical experiments, after which the A, B, C Company, in 1869, attempted to purify the sewage, but gave it up in 1871. It was then allowed to flow into the river Leam. A lawsuit followed, costing the city $25,000, in which it was defeated, and compelled, at an expense of $7,500 more, to purify the river. Lord Warwick then consented to receive the sewage on his estates, the city contracting to deliver it at the highest point of the farm for a period of thirty-two years, for which Lord Warwick engages to pay $2,250 annually. The sewage amounts to a little over 1,000,000 gallons per day, and is distributed over the land, which has not been levelled, by what is known as the "donkey back" system—elevated open drains, on the sides of which is the vegetation. It has transformed the poorest parts of the farm into soil of much fertility, and financially has proved a great success. From eight to nine cuts of Italian rye grass two feet high are made each year. Celery, strawberries, and currants grow remarkably well. The beef, milk, and butter is in great demand, and bring the highest prices. The laborers are in the best of health, and Lord Warwick has received numerous prizes and silver cups for one of the best-kept farms in the kingdom. A more detailed account may be found in Babut du Maris' work.

The sewage farm at Croydon is surrounded by beautiful villas, it being a fashionable resort. The land, which twenty years ago sold for about three hundred dollars per acre, is now worth from $2,000 to $5,000. There has been but one complaint of the farm during the past twelve years, and this resulted from excessive irrigation during a long period of stormy weather, when the hay could not be dried on the land.

A public footpath crosses the sewage farm at Abingdon. There has been no complaint from bad odor.

Babut du Maris says: "It has been claimed that prolonged

irrigation will produce disease by the presence of bacteria in the sewage. Experience is to the contrary. The farms at Edinburgh have received the sewage for over two centuries, that at Buntzlau for two and a half centuries, and for more than ten centuries it has been in practice in China. Vegetation has never ceased to be vigorous and healthy, and the inhabitants have never been known to suffer in consequence of irrigation."

I am informed by a gentleman who has resided seven or eight years in China that in all the large cities the detritus is carried into the suburbs by hand-buckets and deposited on the lands for the benefit of vegetation, and in many instances the same pails serve to bring back drinking-water, with no ill effect except in a few Northern cities, where the sewage is put on the leaves of vegetation; there the tape-worm is very common. Dr. Williams, in his work entitled "The Middle Kingdom," does not include typhus, typhoid, scarlet fever, or diphtheria in a list of the prevalent diseases of China.

It is difficult to make comparisons or draw conclusions when considering this question financially, for the paramount objects to be attained vary in different communities. One town may seek only to get rid of the sewage, another its most profitable employment on the land, another relief from the pollution of a water-course or preservation of its navigability; grotesque and unprofitable experiments and local conditions all contributing to make balance-sheets of great diversity in showing either profit or loss. Many examples of each are available, and should of course be carefully studied.

The city of Paris, for many years harassed by constant complaint and litigation as a result of discharging sewage into the Seine, some years since established sewage farms on the plains of Gennevilliers, the history of which is told in a report to the municipal council by the sixth commission appointed to treat with the State for the concession of such public lands at Achères as are necessary for the epuration of the sewage by irrigation and agriculture.

ORIGIN OF THE QUESTION.

Before the execution of the measures conceived by M. Belgrand for the general healthfulness of Paris, the rain-water

and the washings of the streets flowed into the Seine, either directly or by a great number of drains emptying on the quays of each bank the whole length of Paris. This mode of drainage resulted in the immediate and pronounced pollution of the water in the river, which reached the maximum at the point where it leaves the city. The work of Belgrand had for its result the concentration of four-fifths of the drain-water in a large sewer opening into the river at Clichy, while the remainder was discharged at St. Denis. At the same time the water for domestic supply was largely increased. In 1860 30,000,000 gallons per day were furnished for this purpose; in 1882, 92,000,000 gallons were required each day, or 34,020,000,000 gallons per year. This, with the rain-water which falls on the city, estimated at from 9,576,000,000 to 11,340,000,000 gallons, makes a total of 44,100,000,000 to 45,360,000,000 gallons, which, were it not for evaporation and other loss, should be carried by the sewers. This loss amounts to something like 18,900,000,000 gallons per year, as indicated by gauges in the two sewers, which register 26,208,000,000 gallons—about forty-two per cent. disappearing by evaporation. At low water of the Seine it is equal to 1 part of drain-water to 20 of river-water, and at high water to 1 part in 350. As a result of currents and obstacles in the river, mixing did not take place; and the right bank—the most densely peopled—received on a very long margin the totality of the drain-water, depositing all the way organic matter brought in suspension. Protestations from people living along the right bank of the river followed very closely the opening of the two great sewers; and the State Government required the city of Paris to seriously consider methods of purifying the sewage before discharging it into the river. The savants, engineers, chemists, traders, and agriculturists discussed the subject in all its phases, and to the latter we are indebted for practical solution of the problem.

Filtrage was naturally the first system to be tried. It was soon found that, besides the actual difficulties of filtration on so large a scale, this mode of treatment had the capital vice of leaving in the water soluble organic matter capable of fermentation, and later, chemical agents were resorted to with the object of precipitating the soluble matter, but only incom-

plete results were obtained, which were slow, costly, and inapplicable on so large a scale.

We now come to the experiment which, after fifteen years of study and persevering effort, has given a result most complete and satisfactory. Epuration and utilization by agriculture and filtration by spreading the sewage on permeable land have accomplished this end. It is based on simple principles, of which the demonstration is now made. All argillo-silicious and permeable soils sufficiently thick and well drained have the property of retaining in their superior layers all the organic matter in suspension and solution contained in drain-water spread on the surface of the land. It can receive, without being made damp or marshy, one inch of water per day, or twenty-six feet per year. It transforms the retained organic matter, rendering it capable of assimilation by plants. A very ingenious experiment just made shows this valuable property in the vegetable mould. A hollow column two metres in height was filled with earth in a manner to reproduce exactly the soil as found at Gennevilliers. Through this was passed sewage in a relative quantity to that employed in irrigation and at equal intervals with its use on the land. Epuration took place as completely as in the natural earth. Chloroform was then passed through the column, which at once arrested epuration, and the sewage traversed the column without being purified. Paralyzation of the infusoria stopped oxidation of the organic matter. This experiment has been demonstrated by M. Schloessing, and is described in the report to the Council of Hygiene. If the surface irrigated is under cultivation the fertilizing matter is immediately utilized; if not, it accumulates without loss and transforms the poorest soil into land of extreme fertility.

A very large proportion of the water used in irrigation is evaporated either directly or by the plants in vegetation. The residuary water coming from the subsoil drains is of a remarkable purity, and does not suggest, either by aspect or composition, the sewage from which it proceeds. Irrigation is the most economical and efficacious means of conveying directly to the plants the fertilizing matter of sewage.

Trusting in these principles, and fortified by the works of Messrs. De Freycinet, Schloessing, Marié-Davy, and Frank-

land, the engineers of the municipal service have, since 1867, pursued studies and made experiments for which, notably since 1872, the council has furnished a large amount of money. These efforts have had as a result the great and actual demonstration at Gennevilliers, which evidence impresses favorably all unprejudiced persons who take the trouble to visit the lands.

After some experimental cultivation at Clichy in 1867 and 1868, the irrigation of the plains of Gennevilliers was begun in 1869 by Messrs. Mille and Durand-Claye. In 1870 and 1872 the territory comprised but a few hectares. It has increased each year, until now over 400 hectares are thus employed (about 1,200 acres, which receive nearly one-fourth the sewage of the city). In the beginning the water distributed was limited to a few thousand cubic metres. In 1872, 444,000,000 gallons were used. In 1881, 4,685,000,000 gallons were discharged on the land. In May of this year (1881) 684,300,000 gallons—22,050,000 gallons per day, or 44,100 gallons per hectare per day—these plains absorbed. In 1882, at the time of the report, the distribution reached 34,020,000 gallons per day, or 79,300 gallons per hectare, which represents a sheet of water spread over the surface equal to a little over one inch per day.

The progress, the slowness of which astonishes us now, has not been obtained without difficulty. At the origin, the engineers, relying too much on the very great permeability of the land, had not thought it necessary to establish subsoil drainage. The natural drainage, in consequence of an abundant irrigation, was found insufficient. The level of the subsoil water rose; a few cellars were flooded at Gennevilliers, and gravel quarries were inundated. This was sufficient excuse for a claim for excessive damages against so rich a victim as the city of Paris. To increase the indemnity and to compel a compromise, all possible arguments were employed. Doctor was opposed to doctor, and hygienist to statistician, when it was only a question of a few thousand francs damage to the claimants. These demands were opposed by the engineers, who in turn were very decidedly sustained and supplied with money by the municipal council. The necessary work to insure the drainage of the plains and to remove all pretext for damages was done, and to-day the complaint is rather of the lowering

of the subsoil water. Nevertheless irrigation at Gennevilliers created a prosperity until then unknown, and a time arrived when the community, frightened by the possible result of its demands and outcries—which threatened to be the suppression of irrigation—asked for a contract, the principal article of which was that the city should engage to continue irrigation on the plains of Gennevilliers for twelve years.

The efficacy of this system of epuration is manifest, and presents a brilliant proof. The effluent drain-water has fewer micro-organisms than the water of the Seine when it enters Paris. It has the purity of spring-water coming from the earth. To demonstrate the utility of the system as applied to agriculture has been slow and difficult, and not less laborious than the efficacy of epuration. For the latter the analyses made by the savants were proof beyond dispute, for the former the concurrence of the humblest practitioner; and it required time, much time.

The slowness of experiments in agriculture may be understood when we remember that to reach an end we must go through all the phases of vegetation, from the sowing of the seed to the harvest. Under our climate it is a campaign a year. If we neglect a detail, if we make a mistake at the time of sowing or planting, at the time of plowing or watering, the harvest may be a failure, and we must begin again. The difficulty was increased by local circumstances. Among the cultivators of land in the suburbs of Paris, no one knew the practical working of a sewage farm. One of the persistent workers who had been rewarded by success said recently that it required more than four years to acquire the necessary knowledge. To-day our cultivators are in complete possession of their art, and in the recent horticultural exhibition every one admired the remarkable products which received honorable distinctions.

In agriculture, successes which would be shown by beautiful samples obtained in the fields of experiment would be objects of curiosity. It is necessary to secure economical results, and these go far beyond the utmost expectations. For the landlord of the soil the rent value of the hectare has increased five-fold—from 90 to 450 francs. For the farmer or cultivator the prosperity has not been less. The net value of vegetable products rose from little or nothing to 4,000 francs per hectare.

In a sanitary point of view, the results have not been less satisfactory, and here again it is necessary to observe the facts on the ground. One sees a numerous population, robust and healthy in proportion to its prosperity. Its vigor assures a healthy nutrition equivalent to its works, which is the best hygiene.

As to the effects of irrigation, the same occurs at Gennevilliers which always takes place where irrigation is practised: from the moment it is made frequent, without stagnation, and at regular intervals, a condition which is far from favorable for the development of paludal influences. The determining causes are eliminated; a constant activity is maintained in the vegetable life, which absorbs in its circulation all its own residues and all the organic elements placed within reach. Highly to the honor of the city of Paris be it said that, by the perseverance of its representatives, by the science and devotion of its engineers, the problem of epuration of the residues of cities and of their utilization by agriculture is absolutely and definitely solved. We have no longer the experiment of Gennevilliers; we have a system permanent and regular for the future.

The population of Gennevilliers has increased by farmers coming to occupy the lands, thirty-four per cent. in ten years.

Among the city documents of Paris lately presented to the city of Boston, and placed in the Public Library, may be seen photographs of the departments of this branch of the municipal service, as well as of the products of the land. The commission, in recommending the acceptance by the city of the terms which the State proposes for the extension of the work so as to include the sewage of the entire city, recommends a municipal ordinance which shall require all the water-closets in the city to be connected with the drains, and an absolute abandonment of cesspools, which now are so common in Paris. Up to the present time the city has declined to accede to the terms of the State, as they are deemed too exacting and require a very large amount of money for the purchase of the land. The success of epuration by this method is not questioned. The work of Babut du Maris, lately published, says "the city has just obtained 2,500 acres for the extension of the sewage farm."

The highly satisfactory operation of this system at Dantzic, where the rigorous climate of winter is as great an obstacle to overcome as here in Massachusetts, is sufficient proof that frost is not an objection to its employment on our soil. The land freezes four feet deep at Dantzic. The Vistula is frozen over from the middle of November to March, yet the temperature of the sewage at the mouth of the sewer never goes below 37° F. Irrigation is continued throughout the year with quite as much success in epuration in winter as in summer, although vegetation flourishes but four out of the twelve months.

Sewage in freezing, says Babut du Maris, eliminates its dissolved fertilizing material as thoroughly as salt water eliminates salt by the same process.

There must be abundance of land in the valley of the Blackstone, the Merrimac, and the Connecticut suitable for farms of this character. There is land bordering on Lake Cochituate well adapted to farming for the protection of the lake from the sewage of Pegan Brook. In Arlington, Belmont, and Medford are vegetable farms favorably located, and soil well suited to this system; and before the community embarks in a scheme to build a metropolitan sewer from Natick to tidewater, which, when finished, will be of doubtful utility, judging from the experience of London, this system should be tested, with the object of requiring each and every community to take care of its own sewage.

We have in the soil a chemical laboratory—a perfect filter, oxidation, vegetation, the influence of animal life, and the infusoria combining to protect the subsoil water, and so far as experience goes or chemical analyses can demonstrate, these processes of nature are amply sufficient.

We do not hesitate in covering our fields with fertilizing material where are located springs and wells. We are only solicitous lest the surface-water should convey the material to them, and we raise an embankment above the level of the surrounding land, and otherwise leave to nature the protection of our drinking-water, with full confidence in "*vis conservatrix naturæ*," and if her processes are not complete and perfect, the whole world is gradually becoming saturated with filth.—*Journal of the American Medical Association.*

SEWAGE AND SEWERAGE.

By RICHARD MCSHERRY, M.D., of Baltimore.

AMONG the interesting and important papers recently published upon the above-named subject are two eminently worthy of attention. The one is by B. W. Richardson, of which an abstract was reproduced in THE SANITARIAN for July last, and the other is a paper by Dr. Henry J. Barnes, on "Sewerage Systems and the Epuration of Sewage by Irrigation and Agriculture," read before the Suffolk District Medical Society. The readers of the early issues of THE SANITARIAN will remember that this same subject was ably treated by S. Leavitt, in Vols. I. and II., when it had not attracted so much attention as in subsequent years.

These writers agree in the one point of paramount importance, to wit: that sewage should be restored to the earth from which it is taken. The open question may be, What is the best method of the utilization of sewage? but there can be no reasonable question as to whether it should be wasted or utilized. The sanitarian is particularly interested in such disposition of it that public health shall not suffer from its misapplication. The economist, political or agricultural, may consider and find the best means of making it reproductive and profitable.

How is it used, or misused, about any of our great cities? Chicago is considered to be a "live" and progressive city, up with the times, and yet the residents thereof have their drinking-water dashed with sewage which ought to be otherwise directed. In an editorial in the *Journal of the American Medical Association* of August 16th, on the "Importance of Pure Water," it is said that Lake Michigan supplies the water, and "when unpolluted by sewage, the lake water is remarkably pure and pleasant." *When unpolluted by sewage* is very suggestive. The Chicago River is the sewer, or a sewer, which empties into the lake; and "in the spring, when the river is full, there is sufficient current to carry the sewage far out into

the lake; and when the wind blows from the south, the current is blown directly across the water supply." They have pumping works, which, according to Professor J. H. Long, who has been making analyses of the water, do not conduce to its purity. "It is from this source," says the Professor, "that the lake receives its greatest contamination, for the pumps throw through the conduit into the lake of this vile stuff sixteen thousand cubic feet per minute. When the wind is favorable, a dirty current can be seen floating from the outlet of the conduit toward the crib," "from which," adds the editor, "our drinking-water is obtained. That this contaminates our water can be readily seen from the following figures."

Figures may show detail, but the broad facts are enough. The good people of Chicago never take their drinking-water, however pure it may seem, without the risk of swallowing something horrible, to wit: any filth, bacteria, or germs of disease that may be named, or *innominata*, then polluting that water. In cholera times cholera germs, at all times the productive agencies, call them what you will, of typhoid fever, tape-worms and other worms, scarlet fever, measles, small-pox, and all forms of the so-called zymotic diseases. "When unpolluted by sewage the lake water is remarkably pure and pleasant," but when *polluted*, which it often is, what then?

Now, let us suppose that sewage is perfectly worthless at best, how could a question arise in any rational mind whether it should not be removed, *coûte qui coûte*, at whatever trouble or expense, to some place of safety, where at least it would not find its way into the stomachs, or its gases into the lungs, of the myriads of people, clean and unclean, healthy and diseased, who gave it forth as excreta dangerous, if retained, to the organism in which it was produced? If nothing else can be done with it, let every city have a Tophet, or valley of Hinnom, with a furnace of perpetual fire, a GEHENNA, where all the solid matter shall be reduced to ashes, and the gases shall mingle with the empyrean, where they will be purified; unless, still better, you make of them an illuminating gas, as THE SANITARIAN tells us is done in a city of Germany.

The guardians of health say, Take your excreta away, and before they rot and spoil the air of your city. It is not for them to say where the excreta shall go, or what shall be done

with them. But they may be utilized. The writer may be pardoned for recurring, as he has often done, to a matter that first arrested his attention when serving under General Scott in Mexico. Day by day great closed tanks on wheels passed through the principal streets of the city, and servants brought out from the houses covered buckets, the contents of which were emptied into the tanks. There was nothing offensive observed in the process. The tanks were labelled *Esencias*, which the writer supposed to be facetious, but, in fact, these *essences* were made to enrich the floating gardens, as they were called, about the city, and thus the fertility of the gardens was perpetuated. Certainly this was making a better use of the essences than sending them into the drinking-water. General Chinese Gordon, according to Mallock, thinks the devil the king of the waters, and the Chicago people have some reason to agree with him.

The writer believes, and always has maintained, that what is done in Mexico can be done in all cities. All human excreta should be deodorized and hauled off, day by day, before putrescence, to certain depots, on land or by water, whence they could be transported to factories for utilization. He would have no streams polluted with them, not even the sea, and especially not the Chesapeake Bay. On the contrary, he would have the worn-out lands along that bay enriched by the bromo guano, or whatever it may be called, produced from the city of Baltimore.

We have now a great system of Odorless Companies, which take the excreta off without any offence to the people, but they do their work generally after decomposition and the permeation of the city by foul gases, which kill the little children annually by thousands, whereas by doubling or quadrupling their forces they could take off all human excreta before such dire results could occur.

I was greatly gratified to find the views I have always advocated sustained by so high an authority as Dr. B. W. Richardson. Thus he says: "Closed sewage-tanks movable by night train, closed sewage-tanks movable by steam-power on sewage canals and rivers, closed tanks moved by steam-power on the sea, could convey away all this product for fertilization and deposit it where it could administer its full

benefits to the earth. Barren portions of our sea-coast could by these modifications of the separate system be made the most fertile and beautiful of all our tracts of vegetation."

Dr. Richardson, it is true, is arguing for the separate system, the best of which, I think, for human excreta, is on the wheels of the Odorless Companies; but in the following passage he urges the point always maintained by the writer: "My contention is that the decomposition from accumulations of sewage, which gives origin to the gases that are let out by thousands upon thousands of channels—by tubes from houses, by soil-pipes within houses, by accidental openings and pores in all directions, by gullies in streets, by great outlets of sewage—ought never to have been generated at all, but that the sewage, removed clean away, house by house, many miles from the community, without having decomposed either above or below the living place, should never infect the place nor have any destination except the land which is calling for it and dies if its demands be not naturally supplied" (SANITARIAN, July, 1884).

Dr. Barnes, of Boston, makes an able argument for the trial in that vicinity of "irrigation and agriculture," presenting very strong facts to sustain his argument. The following note which he offers is significant: "In view of the well-known results of chemical analysis of sewage, the question as to its fertilizing properties seems to be out of place. It is almost the only fertilizer the Chinese employ. The Duke of Portland used nothing but sewage on his farm at Mansfield, and obtained a net return of about one hundred and twenty-five dollars per acre" (see *Journal of the American Medical Association*, from August 2–23, 1884).

With the writer the utilization of sewage is but a secondary consideration; nevertheless it is a matter of great importance that its early removal may avail at once in public sanitation and national economy.

BALTIMORE, August 30, 1884.

ADDENDUM.

Since the above communication was forwarded, Col. Adams' interesting paper on sewerage was published in THE SANITARIAN (for August), and I must beg leave to take sides

against a portion of it, and with Drs. Richardson, Barnes, Leavitt, and others.

Col. Adams says: "Sewage is neither lost nor wasted by being cast into the sea; we may safely count upon nature's laboratory for making a proper use of it, while the benefits of being freed from further care of it after it reaches the street sewers is a positive good not to be rated by dollars."

So thought and spoke not Liebig. In an article of mine entitled "The City needs a Change of Air," published in THE SANITARIAN of July, 1882, occurs the following paragraph: "Liebig," says Mayhew (*London Labor and London Poor*), "contends that many an arid and desolate region in the East has been made desolate because men understood not the restoration which all nature demands for the land. He declares that those regions are now desolate because 'the inhabitants did not understand the art of restoring exhausted soil.' It would be hopeless now to form, or attempt to form, the 'hanging gardens,' or to display the rich florescence 'round about Babylon,' to be seen when Alexander the Great died in that city. The Tigris and Euphrates, before and after their junction, Liebig maintains, have carried, and to a circumscribed degree still carry, into the sea, 'a sufficient amount of manure for the reproduction of food for millions of human beings.' It is said that 'could that matter only be arrested in its progress, and converted into bread and wine, fruit and beef, mutton and wool, then cities might flourish once more in the desert, where men are now digging for the relics of primitive civilization and discovering the symbols of luxury and ease beneath the barren sand and sunburnt clay.'"

This, it is true, is rather an economic than a sanitary matter, but when nature's laboratory in some thousands of years does not return to the earth what has been thrown into the sea, it seems better to forestall work so slow and uncertain by the prompter process of converting sewage into a form of manure which will give a more ready return.

RICHARD MCSHERRY.

September 23, 1884.

RETROSPECT AND PRESENT POSITION OF SANITATION IN ENGLAND.

THE first anniversary dinner of the Association of Sanitary Inspectors was held on June 7th, in the Venetian Room of the Holborn Restaurant, London. About one hundred and twenty members were present. Mr. Edwin Chadwick, C.B., the President of the Association, occupied the chair, and was supported by Earl Fortescue, Sir Richard Owen, K.C.B., Captain Douglas Galton, C.B., Dr. Benjamin Ward Richardson, F.R.S., the Baron de Liebhaber, Dr. Alfred Carpenter, J.P., Mr. E. C. Robins, F.R.I.B.A., Mr. G. B. Jerram (Chairman of the Council), Mr. William Rains, Mr. Thomas Rees, Mr. Thomas Buckworth, Mr. Samuel C. Legg (Honorary Secretary), etc.

On the removal of the cloth the chairman rose, and in proposing the first toast said:

GENTLEMEN: I propose the health of one who is regarded as the great and beloved lady-mother of the people of this great empire, our sovereign the Queen; and I may take occasion to state the example she has set to her subjects of the exercise of the functions which are the subject of our Association. One of the first things the Queen did, as soon as public affairs permitted, was to direct a close sanitary inspection of all the cottages on her own estate at Osborne, and attentive action on that inspection. I had the results sent to me, when it appeared that there was a sickness and death-rate by one-third less than the death-rate prevalent elsewhere. From that result I was enabled to declare that if her Majesty's example of proper sanitary inspection and action upon the inspection were generally followed, it would be for her subjects of the wage classes as if every third year there were a jubilee, and there were no sickness and no deaths. I ask you sanitary inspectors to drink reverently the health of her Majesty.

In proposing the next toast, "His Royal Highness the Prince of Wales and the rest of the royal family," the chairman

said: I may note how largely that great family has suffered by diseases which we sanitarians know to be preventable. Of his Royal Highness I may state that in sanitation he is a true son of his great father, the illustrious Prince Consort, whose prominent and sole contribution for the attention of nations at the first International Exhibition was a model cottage of accepted principles of construction, which, as respects damp-proof and washable walls, I take upon myself to say have yet to be realized. Of his royal son I may state that at Sandringham he has set the distinguished example of renewing all the cottages on his estate, and that he has been at pains to supply all the cottagers with pure water from his own works. The water there is from the chalk springs, and hard like a great part of the water supplied to London; but he has had it softened like the supply at Canterbury and other places. It is of the highest purity as a beverage, and saves the cottagers' tea and soap. I am tempted to observe, by the way, that this supply of soft water is what the whole supply of London may be, under unity, and may be delivered—under unity—at three-fourths of a farthing per head for a constant supply; three-fourths of a farthing per head under unity of thirty-two gallons per diem. On his estate he has adopted and sanctioned what we call the separate system of "the rainfall to the river and the sewage to the land." He has recently been the foremost to support the commission of inquiry into the condition of the houses of the poor, and has given to it frequent attendances and close attention to the course of the inquiry. But he has done more than that—he has been the first of any one in his high position to go himself and tread and examine a slum. In doing that he will have acquired a distinct personal perception of the character and importance to the community of some of the chief functions which members of this Association will be called upon to exercise. Let us hope that effective practical measures in sanitation will follow his special attention and services on that commission. We may rejoice in the evidences of his advanced perception of great principles, and the apparently humble details for their application which are conducive to the health and strength of the people and the power of the empire. I propose his health, and the expression of our respect for the practical direction of his attention for the health of the people.

In proposing the toast of the army, the chairman said: In asking you to drink the health of the army, I take occasion to note what sanitation has done for its health and for its strength, and how much more may be done for it by sanitary science. I state it as serving to show the power of those principles in application to the relief of the civil population by specially skilled executive work of sanitary inspection for the application of that science. You may know that heretofore, while the losses in the army by the sword have been as one, the losses by disease, the greater part of which we have proved to be preventable, have been as three. Military service of itself has hitherto kept the military hospitals full, and curative or medical service has not emptied them. But sanitary science of itself, and by its practical application, has gone far to empty them. Our death-rate in the home army was 18 in 1,000. By the work of the Army Sanitary Commission, chiefly with barracks, the death-rate is reduced to 8 in 1,000, and by that diminution upward of four thousand beds are saved that under the old military and curative service would have been required to be occupied. The Herbert Hospital, which was constructed on the scale of the old death-rate, has been half emptied. On the loss of our first army in the Crimea, from the break-down of the curative service, and the entire absence there of a specially organized sanitary service, by the exertions of Lord Shaftesbury with myself, we induced Lord Palmerston to send out a special sanitary commission of three of the sanitary officers who had done good work in our service. And they took out with them as one of their staff a sanitary inspector who had done good work in sanitary inspection in Liverpool, who took with him competent assistants. The result of the sanitary service of that commission was that that second army, as declared by the Minister of War, was brought back in a better state of health and force than it had ever had at home. By the writing of papers and by personal representations I may state that I succeeded in getting some, though only rudimentary, provision made for the application of the sanitary experiences in the Crimea to the protection of the army in India. The old death-rate there was 67 in 1,000. Accounts have been not long since made up, showing that for the last decade there has been a saving of 40,000 of force in sickness and

deaths, and more than five millions in money. But we know, and it must be brought under the consideration of Parliament, that the saving in force and money may be largely augmented at home as well as in India, and grounds may be shown for action for the maintenance as well as the advancement of sanitary science, with a reflex effect for the protection of the civil as well as the military population. Germany—I expect that under the inspiration of her Majesty's son-in-law and of the Crown Princess, who is one of the foremost sanitarians—has been in advance of our administration in availing itself of the experience of sanitary science gained in the Crimea. While our administration lags at 8 in 1,000, Germany has its army death-rate reduced to 5 in 1,000, as against France, still more laggard in sanitation, which has a death-rate of 10 in 1,000. Germany, with its army of 1,800,000, saves some 18,000 deaths every year. If we take the German army at 1,000,000 in time of peace, it saves beyond our laggard death-rate of 8 per 1,000, 14,000 beds, or the contents of about twenty-two Herbert Hospitals; or against the greater French death-rate of 10 in 1,000, it saves about twenty-four thousand beds, or about twenty-six hospitals of the size of Netley. I have dwelt on the examples of the application of sanitary principles to the augmentation of military force and economy, as it may serve to exemplify the possible future of its application under good administration to civil service for the gain of force and economy. It is to be seen whether the public and Parliament will approve of a policy of economizing to the greatest extent the greatest means of economy, by neglecting to support the service which is proved to be productive of the greatest force with the least expense. Of the royal navy, I have to observe that it is, with its death-rate of 5 in 1,000 from sickness, in advance of the army with more yet to do. Dr. Johnson characterized a ship as a prison, with the addition of the danger of being drowned. I see no reason why the navy should not be brought up to the death-rate of a prison, namely, to 3 in 1,000 from spontaneous disease. But look at the death-rate of the commercial marine of 18 in 1,000, and a double death-rate from disease, including scurvy for want of proper sanitary inspection! I propose the health of the army and the augmentation of its health and strength and force by sanitary science, and beg to

couple with the toast the name of Captain Douglas Galton, whose services in the cause of army and general hygiene are well known.

CAPTAIN DOUGLAS GALTON, in responding, said that he felt a peculiar pleasure in having the opportunity of returning thanks for the army on this occasion, because the corps to which he had the honor to belong had furnished the two Generals who have recently most eminently distinguished themselves in military operations. He meant Sir Gerald Graham, who had won such magnificent victories at El Teb, and General Gordon, that modern Chevalier Bayard who was risking his life for his country in the Soudan. Mr. Chadwick told them that during the Crimean War there was a great want of sanitary precautions in regard to the army, and if the army which went to Egypt two years ago had remained in Egypt under circumstances of war for as many months as it remained weeks, there would have been, he believed, a repetition of the first disasters of the Crimea. But there were other struggles going on daily—struggles against disease, struggles against mortality, struggles carried on by an army which he would say had as much the welfare of the country at heart as its soldiers. Those were the army of sanitary inspectors. He was sure they did quite as much for the good of the country as the army to which he had the honor to belong, and he thought the thanks of the country were as much due to them.

DR. B. W. RICHARDSON rose to propose success to the Association, and the health of its President. He said: An old sanitarian, one who has been thirty-five years working in a course of sanitation, and always trying to keep abreast of his fellows, I look upon this movement which you are inaugurating as one of the most important which has ever taken place in the prosecution of sanitary art and sanitary science in this country. While it was essential to the sanitary work of this country that there should be some who would lead, some to take the head-work of the whole question, and then others to follow with skilful hands, with thoughtful minds. And it seems to me that now you have come in as the hands of science. And it is in that sense that Mr. Chadwick, Lord Fortescue, Captain Douglas Galton, and we who have all been so long working, welcome your work. We wish you in the future as

much success as has fallen to ourselves. This Association will become in time a great national institution. You have a wide range of science to deal with. To do your work well, you should be chemists. To do your work well, you should be good mechanics. To do your work well, you should have a certain knowledge of life. You should be physiologists, and should have a good statistical and general knowledge of disease. As regards the great profession to which I belong, there will be, I am sure, no jealousies and no feelings but of contentment that they can intrust you with the great work that must be performed. You will hold to them as sanitary officers the same position that a great body holds to us as assistants. You will become the representatives of a great wave of sanitation. If the country is to be satisfied that you have sprung into existence, how much more ought you to be satisfied that you have had the remarkably good fortune to place at your head the greatest sanitarian of the time? You have heard a man of eighty-four years speak to you to-day. He has spoken with the elasticity of youth, and with that wisdom which springs and can only spring from those years. But if you knew his life as I do—I who am daily reading his works, with the hope, in some kind of way, as best I may, to bring them into something like compass—you would wonder at the President you have before you. Before I was born—and that is fifty-six years, nearly, ago—what do you think he was doing? Why, he was opening the gates of knowledge for those gentlemen who are now taking down our speeches to-night. The very first effort he made was to remove the taxes on knowledge. One of the very finest papers and essays, one which laid the very foundation of the whole, was from the anonymous pen of Mr. Chadwick. Well, you see the police, who are now such an active corps of men, doing such good work. Where did they come from? Whose mind originated the idea of an efficient police system? The idea originated with your President. At that time the burial-grounds were a disgrace to the metropolis. There were chapels where the people were buried right up to the floor. Who took the initiative there? Not altogether alone, but, in connection with others, the unearther of these pestilent places? Your President. There was a time in the history of this country when the whole of the Poor Law system was in a state of

chaotic disorder. Thousands of centres in which mischief was generated of all kinds—false wages, false work, everything on a wrong system. In the midst of an active persecution, one man sprang up and reduced all that chaos to order, and gave us a system which, if in its formation it was somewhat faulty, has yet been found to be one of the best and most comprehensive systems. Who did that? Your President. One thing in science leads to another. After these questions with regard to the ugly social conditions of the poorer classes were considered, the health of those classes came to be considered, because of a great epidemic which sprang up—an epidemic of typhus in this great metropolis. And a commission is formed. The commission is formed at the suggestion of some one—your President. The commission makes a report. It comes to the hand of your President. He puts it into shape and lays it before the authorities of the day, who say it is wise and desirable that we should know the condition of the whole of the laboring classes of this kingdom. He gets another commission which sits all over the country and sends in reports on the condition of the laboring poor, which form a volume that is a standard of history. No man writing on the state of England during the past century can do so until he has read that report on the condition of the laboring classes. That book, which originated again from your President—that book was laid before the Government, and they declined to publish it. They did not see the means to bring it out. What do you think was done? Your President undertook to bring it out himself. Others of the modern advancements of the times you know of—the formation of bills of health, the construction of tables of health, and improvements of various kinds too numerous by far to mention in detail, down even to paving the streets and cleansing the streets. All these came into the range of his comprehensive mind, and he stands there like a fountain of knowledge pouring everything forth as fast as it occurs to him who is sitting here before you—your honored President. Gentlemen, you have exercised a wise discretion in asking Mr. Chadwick to preside over you. You have raised him to some distinction; but there are many of us who think that there are others who might raise him to still greater. When we see honors teeming on men for small services, and for services that

lead often to the destruction instead of the preservation of human life, we do claim that the preservers of life should be occasionally considered. I propose success to your work and good health, long life, and prosperity to your President.

THE CHAIRMAN: I feel overwhelmed by what Dr. Richardson has unexpectedly and so kindly said of me, and by your reception of it. But to avoid egotism, I will only observe before proceeding directly with the subject-matter of our meeting, that after years of delay and obscuration the leading journal, which especially studies and follows public opinion, proclaimed that "sanitary science is the glory of modern times. It is the favorite pursuit of the present day. None is felt to be more needed and is more neglected for all practical purposes. Former generations perished in venial ignorance of all sanitary laws." To retrieve that neglect, one of the first steps to be taken appears to me to remove as much as we may of the venial ignorance, widely prevalent, as to the cost of preventable disease, and as to its proportion of the public burdens, and as to the economy of efficient service and of works for its removal. Take the instance of the metropolis. I confidently estimate that what has been done by sanitation in urban districts elsewhere—from what has been done in sub-districts within itself—a reduction may be made of the present death-rate 5 in 1,000. This will effect a saving for the 4,000,000 of the inner ring of the population of 20,000 lives annually and a saving in money for excessive funerals and for labor lost to the adults by excessive sickness; a total sum of £700,000 per annum. This sum of £700,000 per annum capitalized at thirty years' purchase would give £21,000,000, or £50 per house—enough under a competent administration, as I have elsewhere shown, to pay for the chief primary works required for prevention. All over the kingdom, the losses under the heads I have stated, from preventable disease, are not less than £25,000,000 per annum, or three times the amount of the poor-rates. During the last decade the Registrar-General shows that there has been an important reduction of the death-rate and a saving of nearly four hundred thousand lives, which must have been attended by a saving of upward of four millions of money in England and Wales. This saving must have been in great part due to the services of the 1,700 inspectors, imperfect as their

services were. With more full attributions a larger economy may be anticipated. In sanitation we need no pity, we need no benevolence. We may do all the work of benevolence by going in chiefly for the saving of money. For this work the service of the sanitary inspector is an important and an essential factor. The sanitary inspector is the executive hand of the devising head, the health officer of the sanitary engineer himself. His duty is to effect clearances and to do work which the health officer directs as he cannot do it himself, and in some cases of emergency, in the absence of the health officer, the sanitary inspector must take immediate and independent action for relief on his own practice and knowledge of what should be done. He will have to test the drainage and ventilation of houses, and to see to the proper action of sanitary appliances, and for such service good judgment and much skill is required. In sanitation, altogether, in unpaid as well as in paid service, nothing is so wasteful as ignorance and incompetency. I might illustrate this at great length. Of the great body of the sanitary inspectors, I may state that they are desirous of securities being taken for competency to maintain the efficiency and respectability of the service. The greater proportion of them, I believe, have already proved their competency by their practice. They are desirous that the service should be protected from the ignorance of the "how-not-to-do-its," who give salaries, such as those of illiterate mechanics, that must exclude competency. It is due to the service that it should be placed in the position now accorded to the majority of the officers under the Local Government Board, of permanence in office during good behavior, and of security against the adverse interests to which they must be at times more exposed than other officers. In the performance of their duties they must often see and deal with evils individually, and I consider it important and fair that they should make their individual reports for the information of the local authorities under whom they serve and for the public. The general objects of the Association appear to be in the interest of sanitary progress, and therefore deserve public support. They appear to me to have important new functions in the foreground too long for me to attempt to describe on the present occasion.

MR. WILLIAM RAINS, Vice-Chairman of the Council, pro-

posed "The Visitors," coupled with the names of Sir Richard Owen, K.C.B., and Dr. Alfred Carpenter.

SIR RICHARD OWEN, in the course of an interesting speech, said it gave him great pleasure, and a feeling not without pride, to be invited there by his old and faithful friend their excellent President, to whom and to whose labors he (the speaker) was indebted for his introduction to sanitary work. Sir Richard Owen gave some interesting personal reminiscences of his work as a sanitarian forty years ago, work to which he said he was introduced by their President, more particularly in connection with the town of Lancaster. As one result of the work in which he and other gentlemen had interested themselves at that time, Lancaster had received a good supply of soft water, supplied by gravitation, in lieu of the hard water previously obtained by pumping, and the health of the town had been improved. The engineer for those works was a gentleman well known as a sanitarian, viz., Sir Robert Rawlinson.

DR. CARPENTER expressed his high appreciation of the work of the sanitary inspectors, and dwelt on some of the ways in which their work was hindered by local authorities. The earnest discharge of their duties must be its own reward, for they would receive little thanks from those for whom they labored. That this was so was plain from the fact that their President was still *Mr.* Chadwick. Their revered President had by his labors saved more lives to his country than any man living. But it was not only what he had done himself; the labors of his numerous pupils, among whom he (Dr. Carpenter) was one, must be taken into account in looking at the great services of Mr. Chadwick.

EARL FORTESCUE, who was also called upon to respond for the visitors, referred to Mr. Chadwick's labors in the cause of sanitary reform, remarking that anything which he (the speaker) might have been able to do in connection with sanitary legislation was due to the advice and help of Mr. Chadwick. When he (the noble lord) was a young member of Parliament he was so much struck with Mr. Chadwick's great report of 1842 on the condition of the laboring population, that he took the liberty of calling upon him and seeking further guidance and further instruction from him on that subject. He encouraged him (the noble speaker) very much to take an

increasing interest in it. He recommended to him the slums of London. The word slum, he thought, was not so well recognized then as now, but the thing itself existed, and so did the slummers. On the ground of economy, afterward so conclusively appealed to by their President, on the ground of morality and religion, he felt that something effective must sooner or later be done in that direction. And what he (the noble lord) went through in those single visits to different parts of London, at different lodging-houses, different slums in different towns in many parts of the country, had given him a pretty accurate notion of what are the daily duties of the Inspectors of Nuisances, and of the courage, among other qualifications which are required in those who undertake a duty so important to the best interests of their country. (It was incidentally mentioned by Captain Galton that Earl Fortescue had lost the sight of one eye during his labors on behalf of sanitary science.)

MR. E. C. ROBINS, F.S.A., in giving the toast of "The Executive," remarked that he was extremely gratified to know that their success had been acknowledged by such men as had addressed them. Every one had spoken, and indeed could not help speaking, in admiration of their President. He (the speaker) called himself one of his pupils, because he learned what he knew about sanitation many years ago from his papers. From the personal knowledge he (the speaker) had obtained by attending their meetings, and observing the judicious way in which the Chairman of the Council managed them and helped to make those present more fully understand the business with which they were concerned, the officers brought together were those likely to carry forward the Society to even greater success than it has yet attained.

MR. G. B. JERRAM, A.M.I.C.E., in responding, said: The success of the Association had been what they did not at all imagine when they first started the Association. They never expected that they should be able to report that over 230 gentlemen from all parts of the country had joined this Association. He had also to report that 550 inspectors throughout the country had also approved the resolutions passed by their Association for the better carrying on of their work. They were banded together for the benefit of the public at large;

they were banded together with the idea of helping each other, and getting the protection they deemed necessary to protect themselves and their duties, and to enable them to carry out those duties fearlessly; but in many places the salaries were wretchedly small, while the work was very laborious. He hoped one result of the Association would be to make some provision for the wives and families of those officers who lose their lives in the service of the country. The Association, he believed, would help to raise the status of Sanitary Inspectors. The title Inspector of Nuisances was not in itself very euphonious, and they had chosen another name—Sanitary Inspectors. Inspectors of Nuisances were not looked upon as members of a profession. He might mention that at a meeting of engineers which he attended—for he was an engineer himself—there was a paper read running down the Inspectors of Nuisances. There was an engineer just out of his teens who was also an Inspector of Nuisances, and he (the speaker) said to him, "You had better join our Association." "Oh, no," he said, "I don't do the dirty work; I set some one else to do that." They were members of an honorable profession, and instead of persons of low circumstances and uneducated seeking to fill it, they wished to see men of education trying to enter the ranks of that profession which seeks to save life instead of destroying it.

MR. S. C. LEGG (Hon. Sec.) thanked the company for the kind manner in which his name had been mentioned and received. He felt gratified at seeing the large number of members and friends gathered together at their first anniversary.

MR. JERRAM proposed "The Press," thanking it for the services which it had rendered to the Association, and coupling with the toast the name of the representative of the *Builder*, who, in responding, incidentally referred to the services which had been rendered to the cause of sanitary progress for a period of nearly forty years by the late editor of that journal, Mr. George Godwin, now one of the Royal Commission on the Housing of the Poor, and who always spoke in the highest respect of their President as the greatest authority on sanitary matters.

THE DISPOSAL OF THE DEAD—CREMATION *VS.* INHUMATION.

By G. M. Lamb, M.D.

INHUMATION, the custom of burying the dead in the ground, is sanctioned, from long usage, by a large proportion of the community, though the number is by no means inconsiderable of those who have been firmly opposed to its prevalence.

The time is rapidly approaching when the question of the disposal of our dead must come direct to the front, and must absorb to a far greater extent than it has heretofore the attention of sanitarians, hygienists, the medical profession, and to a considerable extent the public in general.

At the present day the germ theory is making wonderfully rapid strides toward a correct explanation of many of the epidemic and endemic diseases. With the advancement of knowledge of germ production and propagation, with the unceasing researches given to their differentiation (into noxious and innocuous species), we are growing daily to attach stringent importance to the question as to the better means of disposal of our dead to insure protection against disease to the living.

Dr. Domingo Freire, at Rio de Janeiro, has established the fact, in conducting his researches as to the yellow fever and its origin, that the cemeteries and churchyards of that place serve largely as the breeding-grounds of the germ excitant of that fever.

From his and other demonstrations as to these places of interment being the propagating gardens of the germs of disease and death, it would rather strongly urge one to the stern consideration of the question how to repair these existing evils.

In the present mode of burial, inhumation—the most extensively practised—there is, to the individual of unbiased consideration, and who is willing to be guided by his reasoning

power and judgment, something most loathsome and abhorrent. False sentiment, coupled with long-worn custom, has implanted a prejudice in favor of inhumation.

In this country, where the tendency is to such rapid improvement and habitation of formerly uninhabited districts, building is being pushed vigorously forward, and as the result those places of interment of the dead—cemeteries, churchyards, and vaults—which formerly were well isolated from the habitation of man, are now repeatedly seen in the most densely populated portions of our cities, and are, as has been proven repeatedly, great sources of danger to the immediate population.

The appellation "God's acre" is of itself sweet-sounding, and by many who have thought of the subject only as thier prejudice dictated, no doubt regarded as a place beautiful in character, where the dead are reposing peacefully and undisturbed beneath the grassy mounds. Sentiment, void of the stronger forms of argument, associates such an impression with our present mode of burial.

Can we call this a true or even fair representation of the condition of affairs? Are our places of interment the undisturbed resting-places they are alleged to be? If so, how long may they remain such? Can we harmonize the thought of peace, quietude, and beauty with a mass of corruption daily gaining more in its obnoxiousness?

It matters not how beautiful and attractive in appearance our ornamental cemeteries may be, the reservation of the ground for the purpose of interment is but a question of time. Here, where land is ever and with wonderful rapidity increasing in valuation, men are beginning to realize the fact that the ground for such purposes is too valuable, and therefore the increasing practice of disinterment.

That quietude and peacefulness is not what our imagination pictures it, and as only too frequently happens, we witness that rest broken by the unfeelingly directed instruments of the grave-digger.

As R. E. Williams, A.M., remarks, in his work entitled "Cremation and other Modes of Sepulture," "the grave-digger in 'Hamlet' was a model of thoughtfulness in comparison with the men sometimes employed to handle the rel-

ics of humanity, so sacred theoretically and so contemned in fact."

The knowledge of such common occurrences must be one continual source of bitterness to those possessing the finer sensibilities of nature. It will to me ever be with a feeling of pain to know that the form of the loved ones we have placed beneath the damp clay to pass through a stage of corruption covering a period of months or, as is frequently the case, years, is undergoing a slow, loathsome, and horrible process of putrefaction, harrowing to the feelings of those who have witnessed the changes wrought by this slow oxidation, and above all a severe source of danger to the living when, as they are to-day, interred in cemeteries situated in densely populated portions of our cities and towns.

Should one be governed by true sentiment and affection for the dead, it seems only consistent, in view of the many protests against inhumation, that a verdict must be rendered in favor of a mode more suited to the fulfilment of nature's laws.

The majority of those who withdraw in horror from the thought of sepulture by cremation and seek refuge in inhumation do not give the subject the study it deserves. They realize little, if at all, the abominations of the process of oxidation going on in the grave, or the dangers arising therefrom.

From a sanitary and hygienic observation there are many evils growing out of our present systems of disposal of the human body after death due to emanations from vaults, from burial beneath churches, from the saturated soil removed from cemeteries, from malignant diseases, from the bursting of coffins and contamination of the atmosphere with the noxious organic gases.

Numerous are the instances of pestilence due to the products of putrefaction, and many of our cities are in imminent danger from foul sewage, made so by the gases flowing into them from places of burial. Besides these, we must consider the germs of disease that are being given forth from vaults, from tainted waters, from animal putrescence infecting our atmosphere.

Evidence multitudinous, of a sanitary character, demonstrating the urgent necessity for a different mode of sepulture

is repeatedly being brought before us, the existing evil arising from one or many of the causes above enumerated.

With the progress of sanitary science we are enabled to discard many illusions and much sentimentality and give the subject an investigation more thorough. The body buried in the ground, as said by Sir Henry Thompson, pollutes the earth, the air, and water above and around it. From the time mortality quits an organic body putrefaction (according to the nature of the earth in which it is buried) begins its slow or rapid process. The bodies so buried generate offensive organic gases, and myriads of species of disease-producing germs, bacteria of noxious and innocuous natures, as theorized by M. Pasteur's experiments, are carried to the surface by ground-worms, there to become mingled with the air that gives sustenance to the living.

In warm countries, with a moist semi-tropical atmosphere, a porous, easily infiltrated soil, such as we find in the greater portion of our Southern States, one can readily comprehend how these decomposed products can be carried great distances.

In our system of vault-burial we have the evil only intensified by fluids and poisonous emanations saturating the surrounding encasement and corrupting the atmosphere about it. Vaults are abodes of abomination in conjunction with which we can form no thought of the beautiful or sentimental. Such a mode should be condemned as being open to more opportunities for putrid emanation than the system of inhumation.

The danger to life is great from the pollution of the air and water by these decomposed bodies, especially so during epidemic periods, and greatly increased when the bodies buried according to the existing custom have been the subjects of infectious and contagious diseases.

The soil of a cemetery in Rio de Janeiro was densely infiltrated with microbian organisms, which proved to be identical with the products found in the emesis of yellow fever patients. Among the many sources of danger attending inhumation we must consider the contamination of our wells and springs by the products of decomposition. A very large per cent. of the zymotic diseases owe their birth to this carrier of the germs of disease. The excavation of ground for building purposes, dis-

interment of bodies for reburial, has ever been and ever will be a fruitful originator of epidemic diseases.

Take as an instance the plague which caused such a depopulation at Modena in 1828. This was due to the excavation of ground that had been used three hundred years previously for the interment of bodies that had perished from the same disease. Minchinhampton, England, suffered a great loss of population by a malignant disease, resulting from the use of the fertile soil for gardening purposes that had been removed from an abandoned graveyard.

The plague in Egypt in 1823 was due to the reopening of a graveyard, for many years disused. An epidemic of low character occurred in Ritondelle and Bollita, Italy, due to the germs of decomposition being conveyed in the drinking-water requisite for the supply of the villages. The graveyards in these instances were situated upon the hills about the villages, at the base of which issued the springs that were utilized by the inhabitants. These springs derived their constituents of decomposition from the water passing through the remains of the buried dead.

Another instance of comparative nature is the epidemic at Milano, the waters being the highway of communication for the contagious element. Near Dresden there were a large number of cattle buried which had died from the plague, and only a few months subsequently the water issuing from wells in the neighborhood was found to possess a fetid odor, and to contain much matter of an infectious nature.

At Manchester, England, it has been demonstrated that recently excavated graves contain such an amount of carbonic acid gas that before men can descend into them they require to be artificially ventilated. This great quantity of gas flows into the excavation from the surrounding infiltrated soil, and with the minute organisms permeates the soil of cemeteries to the surface.

Instances of such character could be cited *ad infinitum;* reasons of a sanitary and hygienic nature are multitudinous, but apart from all these there are many pleas that can be argued in favor of the disposal of our dead by cremation. We shall be free from the horribleness of the incessant desecration of graves for the purposes of ransom and dissection; we shall

possess the advantage of being able to preserve and transport the ashes, and the matter of expense is greatly lessened by cremating, an item of great import among the poorer classes of our population.

Alike to every other mode, it could be made as costly as the means of the wealthy would permit, but it has been computed to be about one-fourth of the amount required for the disposal by inhumation.

The processes and results of the operations of disposal by ground sepulture and incineration are far different. In an hour or two (depending on the weight of the subject), the process of reducing the body to its constituent elements by incineration is completed, all that was destructible has been destroyed, and the indestructible portion, that which can exert no injury to the living; that which remains to be disposed of as the deceased may have desired, or as our sentiment may dictate, remains.

We would no longer need disturb our minds with the painful thought that the form we loved is lying beneath the ground a mass of putrefaction and fetidness. We could better harmonize the beautiful with the ashes reposing in the funeral urn.

In the process of combustion by cremation there is nothing to offend in the slightest degree the most sensitive. The body is freed from any contact with the flame or smoke, there is no odor, no sound. The products of decomposition are passed through a regenerating furnace, and thereby absolutely purified previous to escaping into the air. In Germany, France, and Italy, where this mode is most largely practised the process is described, in brief, as follows:

The body is placed on a catafalque in front of the altar, the section of floor upon which it rests being constructed for the floor of an elevator. This conducts the body directly in front of the incinerator, which by superheated air has been raised to a heat of 2,000° F.

The body is placed upon a metallic bed, and after having been covered with asbestos, or a linen cloth saturated in a solution of alum, to prevent sudden charring, is passed into the incinerator. It immediately becomes incandescent, and so remains until the process is completed. There remains but a

few pounds of ashes, equivalent to about five per cent. of the original weight.

Cremation of the body can be so conducted as to offend the finer sentiments of no one, and I am convinced that once remove this established prejudice and the practice will become general, and thereby productive of great benefit.

I appreciate the feelings of those individuals who are influenced by false sentiment, and by a mode that long usage seems to sanction to such a degree that I would not, in any manner, attempt to roughly set aside their prejudices.

There is no question but that the number who are disposed to follow the time-worn custom are to-day in a vast majority, and do rule the wishes of the minority, but it is through total ignorance of the many appending dangers that the practice of inhumation affords. I firmly believe that, with the rapid growth of the science of medicine, sanitation, and hygiene, as new theories are proven and demonstrated, the present prejudices will be overcome in a vast per cent. of that majority who are now disposed to disfavor the practice of cremation, and though we do not see the total adoption of it, at least we shall have it an optional matter.

PRACTICAL PHYSIOLOGY IN THE SCHOOL-ROOM.—In teaching physiology, would it not be worth much more to know a few facts about dress, diet, exercise, rest, sleep, good and bad air, than to number and name all the bones, or name and classify all the muscles? The bones will all keep their places, and grow just as rapidly and firmly whether numbered or unnumbered; but both mind and body may fare better if the lungs are not fed on bad air. So the muscles will expand and contract and develop and strengthen, whether counted and classified or not; but they and the whole system may slacken or totally stop their action if the stomach is supplied with unwholesome food. Therefore, let the study be directed at first to parts of the system under control, and afterward, if there be time, to the parts not under control. These latter may be studied for general information as we study comets and eclipses. —*Educationist.*

ENSILAGE FOR THE DAIRY.

OPINIONS concerning the use of ensilage for milk production are steadily crystallizing into established facts. The unwarranted encomiums lavished upon it by over-zealous friends, and the strong condemnation of it by others, are proving equally groundless, and the opposing opinions of both being quietly toned down to a more consistent basis, are demonstrating the correctness of the old adage, that "truth lies between the extremes."

The possibility of preserving green food in a condition to produce milk similar in quality to that derived from the same food fed green from the field, has been accomplished so many times by different persons as to leave no reasonable ground for denial. Not everybody, however, who attempts a silo is successful. The result of general observation is that one-half the silo builders fail in making the enterprise profitable, but this is no argument against a final success. In the introduction of a system so new and different from the customary practice, it would be very strange if failures were not numerous. Their occurrence should be no cause for discouragement. The preservation of forage crops by desiccation is a very old, simple, and well-known process, yet every year many find themselves with spoiled or injured hay, or other fodder crops, from neglecting or not appreciating the conditions necessary to preserve them. A more intricate process of preservation, with no previous experience, ought not to be expected to be any more exempt from imperfect results.

With the facts already established before them, parties now contemplating the use of silos may with perfect safety consider it settled that a satisfactory preservation of green food is possible, and the question for them to study is, how best to accomplish it and make it pay. As most of the ensilaging will be done during the months of August and September, this question must often come up, making it seasonable to notice

some of the landmarks leading to success and some of the obstacles to be avoided. The first great error which has burdened the system of ensilage is a heavy and needless expense in the construction of silos. It has been supposed that the silo must be under ground, or at least partly below ground, and that heavy and expensive walls of masonry were necessary to protect its contents from outside moisture, air, and frost, but it has been found that it is quite as well constructed above ground, and of wood, and that the only protection required is against air and storms. It is not even necessary to make any special protection against frost, for in the first place there is very little liability to freezing on account of the elevated temperature of the ensilage, and in the second place because freezing does no material injury. Freezing alone makes no change in any of the food constituents of plants; it simply ruptures vegetable cells and exposes their contents to decomposition from contact with air, and to loss by the greater readiness with which the liberated matter is washed away by rains. In the silo, by being protected against air and wet, injury from these causes is obviated entirely. Vegetation frosted outside of the silo is perfectly preserved in it, if put in at once before washed by rains or affected by weather. In the construction of silos it is only necessary to protect against frost so far as to obviate inconvenience in handling frozen food, and the detriment to stock from eating needlessly cold rations.

Very cheap structures, either wholly or partly above ground, are now found to be quite as efficient as the more costly primitive buildings. The cheapest are those made with a balloon frame, with studs stiff enough to prevent the sides from bulging under heavy pressure, and double-boarded on the inside with plain boards, with paper between them. Things with the lowest cost, however, are not always the best in the long run, and we certainly would not advise any dairyman to vitiate taste and mar pleasure by making an ill-looking structure for daily observation.

Cost is often saved and convenience served by locating a silo in some part of a barn, with its base on a level with the cow-stable floor. Wherever located, the main essentials must be kept constantly in mind—protection from the weather, keeping as nearly air-tight as possible, and convenience in getting

the ensilage to the stock. Silos should be steep rather than shallow, and not wider than a convenient length of plank for covering them. Increased capacity is best made by increasing the length. The most approved covering consists of sound two-inch plank, matched and put together in sections three to four feet in width. Boulders of a convenient size for handling are generally preferred for pressing down the covering, and when these are not at hand, bags of sand make a convenient substitute, using enough to give a pressure of 2,000 pounds on each square yard of surface.

Any kind of fodder-plants can be preserved in a silo, but what is to come out of it will depend very much on what is put into it. This much may be considered certain, that no more food can come out of a silo than is put into it. When the life of vegetation ends there is an end to the increase of food in it, and all changes thereafter occurring tend to diminish rather than to increase the sum total of food constituents it contains. Changes may occur, as by cooking or fermenting, by which some portions of food may become available that would not be available without such change, but any absolute increase of food is impossible. If poor food is put in, it will be poor food when it comes out. It should be borne in mind that the great value of a silo consists in *preserving* food, not in *increasing* it, and that whoever expects to take out of a silo more than he puts in will be expecting an impossibility.

One of the best crops for preservation is fodder-corn—the forage most commonly preserved. It is best for two reasons: first, because of the very large amount grown on a given space; and second, because if cut at the right time it is one of the safest crops to keep. The general experience goes to show that very succulent and immature fodders, cut when containing but little sugar, are most apt to ferment, develop bad odors, and mould. Fodder may be preserved cut at any stage of maturity, but it requires more skill and exactness in conditions at some stages than at others. Fodder-corn, for producing milk, is best cut when near maturity. It then contains the most nutriment and the most saccharine matter, and is preserved with the least change and the least odor. This is a very essential consideration in the dairy. The great objection to ensilage for milch cows is its unfavorable effect upon the flavor of milk,

and hence it is very important to observe every condition bearing upon this point.

Later experience is modifying considerably the method of filling silos. Formerly it was thought necessary to fill in the shortest time possible; now slow filling is considered best. It is considered preferable to fill by degrees and to protract the work till heating in the mass is well under way, and a temperature of 120° or above is reached before the cover is put on. Further change is then greatly abated.

It is often urged, and with some plausibility, that for milk production it is important to mix different foods in the silo, so that the ensilage shall make a complete and well-balanced ration for producing milk. There would be more force in such a proposition if ensilage constituted the whole food of the dairy. This it should never do, because there is always so much acid in it as to make an excess injurious if ensilage constitutes the whole ration. It ought not, when in its best state, to constitute over half of the daily food, and it is believed to be better to balance up the imperfections of corn ensilage by way of the food used with it, than to make the ration perfect in the silo, at the risk of vitiating flavor and quality in the combination.—*National Live Stock Journal.*

SUNLIGHT IN STABLES.—We tried an experiment, some years since, to test the effect of absence of light upon a calf. We had two deep-red calves of the same age (sixty days), one weighing 180 pounds and the other 182 pounds. The latter we placed in a dark room, with a trough that could be filled by a spout through a partition. The other was confined in the same amount of space, but in full light, and both were fed exactly alike for the next three months. The object was to test the effect of light upon such a growing animal. At the end of that time, the one in the light weighed 430 pounds, and the one in the dark weighed 360 pounds; and its color had faded to a very pale, dirty red. Its eyes were so much affected when admitted to the light, that it kept them closed most of the time for the first week or two. The two calves were kept on together, but the one from the dark room never fully recovered from this three months of darkness. It never recovered its

bright red color, although the color improved. Any one who noted these two calves during this experiment would never after doubt the impolicy of a dark stable. Sunlight is indispensable to healthy vegetable and animal life. Every farmer sees his cat and dog select a belt of sunshine on the floor to lie and bask in; and if he will watch his cattle when turned out, he will find them seeking at once the sunny side of the barnyard. And with all these indications before his eyes, still the farmer keeps his animals in a dark stable, much to their discomfort and his pecuniary loss.—*National Live Stock Journal.*

OATMEAL NINE DAYS OLD.—I find that oatmeal-porridge is greatly improved by being made some days before it is required, then stored in a closed jar, brought forth and heated for use. The change effected is just that which theoretically may be expected, viz., a softening of the fibrous material, and a sweetening due to the formation of sugar. This sweetening I observed many years ago in some gruel that was partly eaten one night and left standing until next morning, when I thought it tasted sweeter, but, to be assured of this, I had it warmed again two nights afterward, so that it might be tasted under the same conditions of temperature, palate, etc., as at first. The sweetness was still more distinct, but the experiment was carried no further.

I have lately learned that my ensilage notion is not absolutely new. A friend who read my Cantor lectures tells me that he has long been accustomed to have seven dishes of porridge in his larder, corresponding to the days of the week, so that next Monday's breakfast was cooked the Monday before, and so on, each being warmed again on the day fixed for its final execution, and each being thus seven days old. He finds the result more digestible than newly made porridge. The classical nine-days'-old pease-pudding is a similar anticipation, and I find, rather curiously, that nine days is about the limit to which it may be practically kept before mildew—mouldiness—is sufficiently established to spoil the pudding. I have not yet tried a barrel full of pease-pudding or moistened pease-meal, closely covered and powerfully pressed down, but hope to do so.—From "The Chemistry of Cookery," by W. MATTIEU WILLIAMS, in *Popular Science Monthly* for September.

CANNED FOODS.

By JOHN P. HAWKINS, C. S., Brevet Major-General U. S. Army.

THE army posts throughout the United States have been for a long period, now nearly twenty years, supplied with canned articles, fruits, meats, vegetables, and preserves. Many of the posts are located where it is not possible to cultivate gardens, either on account of poverty of the soil, lack of rainfall, or rigor of climate, and as a consequence there is hardly a military station in the land where officers and soldiers and their families do not habitually use canned foods; and as a class army people are without doubt the largest consumers of canned articles in proportion to their number of any other in the country. While one occasionally sees an article in a newspaper telling how some one has been taken sick by reason of having eaten something from a can, yet in all my army experience (and for many years I have been Chief Commissary of a military department, and as such had charge of supplying posts with all their subsistence) I have never known or heard of a case of canned-goods-poisoning in the army.

The canned foods used are not of any particular packing, either. We buy a good article, and from any packer that will furnish a proper quality, and there is considerable competition among packers to furnish us. Nor are our canned foods purchased in any particular section of the country, but usually from the packer or manufacturer who converts the crude material into the canned article, and our points of purchase extend from Maine to Texas and from the Atlantic to the Gulf. So it will be seen that our army supply is drawn from the same sources that supply the people at large, and that civilians and our army consume the same canned articles and under the same circumstances. I recently inquired of our medical director, Lieut.-Col. John E. Summers, Surgeon U.S.A., a careful and skilled observer in his duties, and of large experience in his army profession, whether he had ever known of a case of poisoning in

the army which might be attributed to canned goods, or whether any of his medical officers at military posts had ever reported such a case to him. To both inquiries he answered, No; he had never known or heard of such a case. As in his official capacity he has been for many years in the constant receipt of formal reports concerning the health and mortality of all the posts throughout the country, and statements as to causes operating to influence the health of every command, it would certainly follow that if ever there was a suspicion on the part of a medical officer that any canned food was the cause of a sickness or a disorder, there would be every probability in favor of its being reported and known to him and to the entire medical profession of the army.

A further important fact in this connection is that soldiers often report sick to the surgeon for very trifling ailments, and as a class they are under more watchful scrutiny than any other class of people; and so if a case of poisoning which could justly be attributed to canned goods were ever to occur among them, even if not fatal or serious, there would be but a small chance that it would not come to the knowledge of the post surgeon. It would be almost an impossibility that he would be ignorant of the case and the causes.

Deductions from the foregoing may be fairly made that the reports of poisoning by eating canned food are not to be believed, or are only to be believed when it may have occurred by reason of the person having eaten from a can the food in which was evidently spoiled, and so spoiled that the appearance of the can would surely have indicated the unsound condition of its contents to a person exercising ordinary care. If a person buys tainted meat from the butcher and eats it, knowing it to be a little *off*, and is taken sick, he must blame himself for trifling with his health; and likewise if he buys canned food of suspicious appearance, he must expect to pay in health for his carelessness or temerity. Therefore, having no apprehension as to the method of packing an article, whether in tin or in glass, whether soldered with the aid of an acid or soldered inside or outside the can, there is every reason to consider canned articles as good for food as any food can be. The experience of our army ought to be conclusive on this subject. And no person having a decent knowledge of what is good or

bad, sound or unsound, could be misled into eating an improper article from a can, any easier than he could be induced into eating a decayed potato or a tainted piece of butcher's meat.—*American Grocer and Dry Goods Chronicle.*

ACORN BREAD.—The Indians scattered along the foothills of the Sierra are a quiet, inoffensive people. They do not appear to be governed by any tribal laws, yet adhere to many of their old traditions. One or two men of superior ability and industry form a nucleus around which others less ambitious gather. Here they fence with brush and logs a tract sufficient for their requirements of hay-making, pasturage, etc. Although they often indulge in the food of civilized nations, the acorn is still a favorite article of diet in every well-regulated wigwam. The process of converting this bitter nut into bread is curious. Under the branches of a grand old pine I found them at work. They had shucked and ground in the usual manner a large mass of the acorn meats. A number of circular vats had been hollowed out of the black soil, much in the shape of a punch-bowl. Into these was put the acorn pulp. At hand stood several large clothes-baskets filled with water, and into these they dropped hot stones, thus heating the water to the required temperature. Upon the mass of crushed bitterness they carefully ladled the hot water, making it about the color and consistency of cream. Not a speck appeared to mix. A buxom *muhala* stood by each vat, and with a small fir bough stirred the mass, skilfully removing any speck that floated upon the surface. The soil gradually absorbed the bitter waters, leaving a firm white substance, of which they made bread. I asked to taste it, at which they said something in their language, and all laughed. I asked again, and after more laughter I was handed a small particle on a fig leaf, and found it sweet and palatable. They began to remove it, and so adroitly was this done that but a small portion adhered to the soil. They spread it upon the rocks, and in a short time it was fit for use. This, I am told, they mix with water, put it into thin cakes and bake before the fire.—*San Francisco Chronicle.*

THE POSITION OF THE WOMEN OF THE SOUTH.

By Mrs. E. B. Cheesborough.

SINCE the necessity has arisen for Southern women as a class to join the army of women workers, there seems a disposition to blame the men of the South that the women of that section were not enrolled sooner in that vast company.

The necessity did not exist for the majority of Southern women to earn their living, and those that were compelled to do so met with no opposition from the men. That these ladies should have contented themselves with such occupations as teaching, sewing, and keeping boarding-houses, was not because man's prejudices barred the gates to something higher, but because women themselves had neither the training nor wish for anything else. As to entering the professions, they showed no disposition to do so. It is a notable fact that the first woman physician in this country, Elizabeth Blackwell, an English woman, studied under Dr. John Dickson, of Asheville, N. C., and subsequently under his brother, Dr. Samuel Henry Dickson, of Charleston, S. C. These gentlemen were refined, high-toned, and full of courteous chivalry to woman. They did not deny her the right to work in her own way and to pursue the bent of her talent; and these two Southern men it was who gave to the first woman who studied medicine in the United States her early instruction, and this in defiance of all established precedents. Did any other woman follow her example at the South? Not then, and up to this day very few have. It remained for the Northern and Western women to do what the Southern women shrank from, and now at the North there are many lady physicians in lucrative practice, while at the South there are very few.

The Southern woman lacked independence. She would not, for the world, do what other women were not doing, and she tied herself to her grandmother's apron-strings and would not break loose. Reared in the privacy of a charming and refined home, indulged in a way that only Southern fathers dreamed

of doing, looked upon by her brothers as not of common clay, waited on and flattered by the old family servants, who walked after her to school with her books, and when she "came out" took pride in seeing her dressed for the ball, and surrounded by admirers—these Southern women lived happy lives amid the sunny bowers of their own Southland.

It was surely no lack of "chivalry" on the part of Southern men that made them content and even pleased to see the women of the family exempt from the turmoils and disappointments of business life. It was rather an excess of chivalry—the feeling that would shield woman from the knocks and bruises of the outside world. They gladly went forth to meet the thorns, and left her at home to enjoy the roses. They gathered the spoils, and it was at her feet they laid them.

When our first parents were driven from Eden, the Divine voice that reached Adam said, "Work." By the "sweat of his brow" he was to gain his bread. No such command was given to Eve. The "mother of all living" had another work to do. She was to be her husband's "helpmeet." How? Not to stand beside him and dig and delve, not to exhaust her strength in doing the work that was none of hers. Hers was a higher mission—a mission of love, of tenderness, of sympathy. She was to help by her affection and devotion. She was to be the dove that was to bear the olive branch of peace over the stormy waters. She was "to partake of, but never to waste," man's wealth, and to save it, but not to help to make it. In her dreams she never saw

> "Two heads in council, two beside hearth,
> Two in the tangled business of the world,
> Two in the liberal office of life."

She saw something better than that, and she was glad that her chief good and her highest aim lay not in money-getting nor in office-filling, but in the pleasanter work of elevating, refining, and sanctifying home, and in dispensing there the gifts of her love and sympathy.

The Southern women were happy in the lives they led—lives that gave them leisure to cultivate the social amenities of life, leisure for self-improvement and for the gentle charities. They had time to exercise a queenly hospitality, to rear their

families, to minister to the sick, and to look after their household. Why should they wish to find another fate? What gain could they promise themselves, in the way of happiness, in the forum, in the crowded marts of trade, or in the jostling ranks of professional life? "I have died ten deaths," said a Southern lady of culture and refinement, "in going through the New York press." She was courageous and resolute; she sought literary work and procured it, but this sensitive woman "died ten deaths," nevertheless, in encountering the surroundings of the newspaper office.

The Southern man did not force the Southern woman into the position she occupied. It was in the natural order of things that she should find this position, and it was in the natural order of things that she should keep it. When a new order arose, her position changed; and that she had made no preparation to meet the change was not her fault, nor that of any one else. She will learn a lesson, perhaps, from the past; and every Southern girl will learn some special branch by which she can maintain herself when the necessity arises.

A woman does not attain her highest development in work, and the Southern women have much to be thankful for in the past. What they may have lost in some respects they have gained in others. If they did not become, in the past, lawyers, doctors, and preachers, it was "their own sweet wills" that kept them out of these professions, and not the want of "chivalry" in the men of their section. It was the prejudices of the past; it was the iron rule of tradition; it was the shades of the grandmothers; it was woman *versus* woman. The women never sought to come out of the old grooves, as did Elizabeth Blackwell, who found her first encouragement in that magnanimity which is the essence of true chivalry—the chivalry of a Southern gentleman.

The Southern woman of the past was by no means a nonentity; neither is the Southern woman of the present. It was a Southern woman, Anna Pamela Cunningham, of South Carolina, who started the undertaking, and who was chiefly instrumental in carrying it out, to preserve to the country the home of Washington. Although an invalid, she wrote appeals and sent them over the country, and by her eloquence succeeded in interesting such men as Edward Everett in her undertaking.

It is the women, not the men of South Carolina, who have raised the money to erect a monument to Mr. Calhoun, and which is now being sculptured in Rome. The women of that State have raised several monuments to the Confederate dead, and the women of other Southern States have carried out the same work.

In literature the Southern woman is not by any means unknown. The three most popular female novelists, whose works sell the best, are Southern women—Mrs. Southworth, Mrs. Wilson (Miss Evans), and Marian Harland. Another Southern woman, Miss Fisher ("Christian Reid"), has achieved popularity by her novels. With the exception of Alice Carey, who will ever remain "the Queen of American song," Mrs. Welby, a Southern woman, takes first rank as a poet. Then there is Mrs. Margaret J. Preston, of Lexington, Va. There are several Southern women on magazines and newspapers in New York City, one of whom has edited two different publications there quite acceptably.

The Southern woman has shown herself fully equal to meet the emergencies of her changed position. Throwing herself into the great conflict of work, she has come off conqueror, by her ambition to excel, force of will, and patient industry. When there was no necessity for her to be a money-getter she was content with her home duties, her social life, and her works of charity; but when the necessity arose she did not shrink from it; and if not prepared to put on all the armor of work and to handle all the weapons of warfare, she has succeeded pretty well in fighting the enemy poverty.

It is a significant fact that the only woman bank president in the United States presides over a bank in North Carolina. This proves that where a woman is found capable Southern men do not object to her filling important and responsible positions. "They who would be free themselves must strike the blow;" and the women who aspire to fill positions of trust and honor must make themselves capable before they ask man's suffrage and sufferance.—*The Planters' Journal.*

STORY OF LIEUTENANT GREELY'S RECOVERY.

THE story of Lieutenant Greely's recovery after his rescue from Cape Sabine is given by Passed Assistant Surgeon Edward H. Green, U.S.N., of the relief ship Thetis, in a communication to the *Medical Record.* The cases of Greely's six fellow-survivors, it is remarked, were very similar to his. The condition of all was so desperate that a delay of two hours in the camp was necessary before they could be removed to the relief vessels. Brandy, milk, and beef essence were administered.

Lieutenant Greely's disease is called by the surgeon asthenia, a diminution of the vital forces. Greely fainted after being carried to the wardroom of the Thetis. When he was brought to, a teaspoonful of minced raw fresh beef was given to him. His clothes were carefully cut off of him, and heavy red flannels, previously warmed, were substituted. He was excessively emaciated, and his body emitted an offensive odor. His skin hung from his limbs in flaps. His face, hands, and scalp were black with a thick crust of soot and dirt. He had not washed himself or changed his clothing for ten months. He had lived a long time at a temperature inside the hut of from five to ten degrees above zero. He was nervous and irritable, at times almost irrational, and his eyes were wild and staring. He insisted on talking, craving news and demanding food, but he complained of no pain.

His tongue was dry and cracked and coated a brownish-black. He was ravenously hungry. His pulse was 52, and soft or compressible. His skin was cold, clammy, shrivelled, and sallow. His temperature under the tongue was 97.2°. There was great muscular waste, and he was unable to move or to stand without support. Before leaving Fort Conger in August, 1883, he weighed 168 pounds. He now weighed 120 pounds. He was carried aboard the Thetis about 11 P.M. on June 22d, it being then broad daylight in that region, and his treatment from that hour until 8 o'clock the next morning was

a teaspoonful of minced raw beef, alternated every half hour with a teaspoonful of milk punch. Strict quiet was enjoined.

On June 23d Surgeon Green was compelled to allow him to read some letters from home, after which he seemed less restless. He talked rationally, but showed a loss of memory in often repeating what he had previously said. He had not closed his eyes in sleep since his rescue. There was excessive constipation. The treatment was the same as during the night, except that finely cut raw onion was added to the minced beef, and half an ounce of milk punch was given every two hours.

On the next day, June 24th, although he had yet had no sleep, and he showed a great desire to talk and read, there were signs of improvement. He was less persistent in demanding food, his tongue presented a moister appearance, he began to complain of soreness in his limbs, and his heart sounded stronger. Surgeon Green had him sponged with tepid water and briskly rubbed with flannels. He gave him a small quantity of oatmeal thoroughly boiled, beef essence, and scraped beef and onion.

On the next day, June 25th, Lieutenant Greely slept for the first time. He awoke after two or three hours, much refreshed. He talked without excitement, and his tongue and skin began to look more natural. His muscles felt sore and his ankles were puffed.

On the next day, June 26th, his mind was tranquil, but there was a loss of memory of words. He was allowed to sit up in bed and read a little. He slept six hours. For the first time since his rescue medicine was given him, some muriate of iron.

On the next morning he got eight ounces of broiled steak, and on the following day, June 28th, he dressed himself and sat up for two hours. His food was now gradually increased from day to day, and he continued steadily to improve. On July 1st he was well bundled up and allowed to sit on deck for an hour in the sunshine. On July 17th the Thetis arrived at St. Johns.

Lieutenant Greely's muscles were now filling out rapidly, and he was allowed to go on shore and take exercise. Here, Surgeon Green says, the Lieutenant committed an error in diet at the American Consul's table, and suffered for two days with

a slight attack of intestinal indigestion. On July 25th, for the first time, he was allowed to eat three square meals. Six weeks after his rescue he had gained 49 pounds. He gained 9½ pounds the first week, 15 pounds the second week, 8 pounds the third week, 7 pounds the fourth week, 5½ pounds the fifth week, and 4 pounds the sixth week.

Surgeon Green adds, under the head of "remarks:" "Vital depression, as exhibited by the temperature, not marked; digestion fairly good all the time; nervous system soon calmed. Microscopic examination of blood disappointing, exhibiting no unhealthy character of red blood-globules. Liver not secreting. Large gain in weight, due to rapid assimilation of food, owing to a great muscular waste."

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH ENDING JULY 31, 1884.

Arrival.	Vessels.	From.	Passengers.	Deaths.	Births.
July	1, Rugia,	Hamburg,	632	1	
"	1, Erin,	London,	187	2	
"	3, Noordland,	Antwerp,	511		1
"	5, Heimdal,	"	54	1	
"	6, Australia,	Hamburg,	421		1
"	7, Gellert,	"	595		1
"	9, Canada,	Havre,	321		1
"	10, Belgenland,	Antwerp,	384	1	
"	12, Thingvalla,	Copenhagen,	265		1
"	14, Katie,	Stettin,	157	1	
"	16, Amerique,	Havre,	332	1	
"	17, Bohemia,	Hamburg,	1,008	1	
"	18, Salier,	Bremen,	536	1	1
"	22, Bolivia,	Glasgow,	248	2	1
"	24, St. Laurent,	Havre,	286	1	
"	26, Britannic,	Liverpool,	557	1	
"	28, Rhaetia,	Hamburg,	634	1	
"	31, Oder,	Bremen,	656		2
			7,784	14	9

MORTALITY STATISTICS IN THE UNITED STATES.

FOUR WEEKS, ENDING JULY 26, 1884. Correspondents under this head are requested to send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
Burlington, Vt., 12,500	31	16	4	..	..	..	..	4	..	7	29.7
Boston, Mass., 427,940	708	346	128	14	13	..	22	8	..	150	21.4
Lowell, Mass., 68,500	134	46	17	..	..	..	..	2	..	36	25.4
Lynn, Mass., 38,284	48	16	12	..	..	..	2	2	..	2	16.1
Somerville, Mass., 28,663	...	...	..	..	..	..	..	..	..	...	....
Worcester, Mass., 58,295	109	52	21	9	..	..	..	..	..	24	24.3
†Providence, R. I., 120,000	195	112	28	5	2	..	8	1	..	68	25.1
†New Haven, Ct., 75,000	166	91	19	3	3	..	..	3	..	75	26.5
New York, N. Y., 1,356,958	3,642	2,191	684	101	48	118	52	55	..	1,189	34.8
Brooklyn, N. Y., 624,118	1,534	956	207	27	12	12	33	33	..	601	31.0
†Rochester, N. Y., 105,000	...	...	25	1	..	..	2	3	..	14	15.4
Albany, N. Y., 97,344	196	93	43	6	6	..	5	4	..	49	26.1
†Auburn, N. Y., 25,000	39	5	5	..	..	..	..	1	..	3	18.3
Yonkers, N. Y., 21,000	35	24	4	..	..	..	..	1	..	18	21.7
*West Troy, N. Y., 13,000	27	14	3	..	1	..	..	..	..	12	8.1
Hudson Co., N. J., 209,000	435	235	56	8	9	2	1	13	..	98	27.4
†Paterson, N. J., 57,000	135	91	19	..	6	..	..	1	..	33	30.8
§Philadelphia, Pa., 927,995	869	467	123	19	13	9	5	30	2	165	24.8
§Pittsburgh, Pa., 180,000	165	62	18	7	4	4	1	1	..	60	23.8
Erie, Pa., 36,678	...	...	..	..	..	..	..	..	..	...	....
Wilmington, Del., 51,500	131	87	8	1	2	..	..	3	..	41	33.0
*Cincinnati, O., 280,000	336	150	52	7	5	1	4	8	..	75	20.8
*Cleveland, O., 200,429	263	165	34	7	..	20	4	6	..	78	22.7
Toledo, O., 52,000	..	...	..	..	..	..	..	..	..	...	....
†Detroit, Mich., 140,000	440	151	56	29	6	6	5	2	..	139	37.0
Evansville, Ind., 40,000	86	48	15	..	..	3	5	2	..	19	27.9
Rock Island, Ill., 11,650	9	7	1	..	..	..	..	..	..	1	9.9
†Chicago, Ill., 580,000	1,583	1,111	165	43	20	61	10	38	..	550	30.1
†St. Louis, Mo., 400,000	876	489	106	18	11	5	2	50	..	210	26.2
†Milwaukee, Wis., 145,000	268	99	30	4	3	2	3	7	..	76	21.4
Omaha, Neb., 50,000	...	..	..	..	..	..	..	..	..	...	....
Salt Lake City, Utah, 22,000	54	25	4	3	..	..	..	1	..	12	31.8
†San Francisco, Cal., 235,000	452	163	84	13	2	3	2	19	1	27	23.0
†Minneapolis, Minn., 100,000	268	193	19	14	2	5	1	4	..	114	32.9
†St. Paul, Minn., 100,000	249	198	21	5	1	4	3	1	..	94	29.8
Baltimore, Md., 408,520	816	496	97	19	5	6	16	30	..	260	25.9
†Dist. of Columbia, 145,010	425	195	80	8	6	..	7	13	..	86	25.5
†Richmond, Va., 73,400	208	103	17	1	..	2	..	12	..	36	34.0
Lynchburg, Va., 23,000	32	16	6	..	..	1	..	1	..	6	18.0
New Orleans, La., 234,000	626	253	98	3	2	5	8	46	19	68	34.7
†Nashville, Tenn., 50,000	121	51	16	5	..	..	2	10	..	11	29.0
†Mobile, Ala., 31,000	96	39	9	..	..	..	..	11	..	4	36.7
Jacksonville, Fla., 10,000	...	...	..	..	..	..	..	..	..	...	....
Grand Rapids, Mich., 42,000	...	...	..	..	..	..	..	..	..	...	....
Lansing, Mich., 8,319	...	...	..	..	..	..	..	..	..	...	....

* 3 weeks; § 2 weeks; † Month of July.

MORTALITY STATISTICS ABROAD.

SECOND QUARTER, ENDING JULY 31, 1884.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Typhoid and Typhus Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,019,361	19,944	4,444	9,150	395	343	1,024	1,296	207	293	257	19.8
Liverpool, 573,202	3,546	816	...	56	28	235	249	48	50	45	24.7
Glasgow, 517,941	3,400	697	685	55	75	58	249	33	10	73	26.3
Birmingham, 421,258	2,181	534	...	10	30	120	71	14	8	38	20.7
Dublin, 351,014	2,253	372	419	28	76	5	21	49	..	17	25.7
Manchester, 338,296	2,150	510	...	4	70	53	72	9	3	32	25.4
Leeds, 327,324	1,976	470	...	13	99	120	29	21	..	29	24.1
Sheffield, 300,563	1,533	322	...	2	125	2	29	19	20	13	20.4
Edinburgh, 246,703	1,325	238	247	21	14	24	122	24	..	33	21.5
Belfast, 216,622	1,197	189	324	9	22	2	22	18	..	29	22.1
Bristol, 215,457	921	200	...	3	17	5	24	13	..	17	17.1
Bradford, 209,564	1,016	231	...	2	5	32	2	16	..	21	19.2
Hull, 181,225	804	201	...	1	3	1	19	8	9	13	17.7
New Castle, 151,825	767	169	...	2	29	1	26	13	9	6	20.3
Havre, 105,867	745	149	86	24	10	2	6	13	..	63	26.1
Reims, 93,823	644	156	72	31	..	3	3	4	..	102	27.3
Nancy, 74,954	496	85	43	3	3	2	...	6	1	20	26.5
Breslau, 290,000	2,236	671	224	52	10	92	1	24	..	131	30.8
Brussels, 171,293	1,075	214	147	23	9	2	18	14	57	104	25.1
Cologne, 150,513	1,021	343	113	5	2	1	37	4	..	82	27.1
Christiana, 122,000	533	116	78	16	24	...	16	1	..	28	17.5
Frankfort, 145,100	773	207	101	16	6	...	16	5	..	45	20.8
Hanover, 131,200	...	...	...	..	..	...	...	..	..	...	...
Bremen, 119,561	639	189	72	16	15	2	8	2	1	16	21.4
Dantzic, 116,162	716	277	40	20	18	...	15	6	1	67	24.7
Stuttgart, 109,937	624	226	61	15	3	22	12	2	..	48	22.7
Strassburg, 110,739	...	...	...	..	..	...	...	..	..	...	...
Dusseldorf, 105,287	680	275	54	8	2	7	9	8	..	37	25.8
Nuremburg, 105,176	723	216	136	12	6	...	13	6	..	65	27.5
Chemnitz, 102,713	758	344	28	36	3	1	1	4	..	12	29.5
Magdeburg, 105,000	604	182	53	14	4	8	8	7	..	28	23.0
Elberfeld, 101,000	576	147	60	22	33	2	9	8	..	16	22.8
Barmen, 100,000	515	127	33	25	6	2	10	8	..	37	20.6
Altona, 97,000	600	168	64	19	8	3	12	7	..	29	25.8
Aix-la-Chapelle, 89,116	634	218	67	6	..	3	20	7	..	35	28.5
Mayence, 64,120	...	...	...	..	..	...	...	..	..	...	...
Amsterdam, 350,202	2,462	...	...	172	75	52	10	21	3	1	27.3
Rotterdam, 166,001	1,379	...	...	17	10	187	11	6	..	13	33.2
The Hague, 131,417	869	...	...	21	10	43	5	8	..	4	26.4
Lyons, 376,613	2,266	...	408	34	9	30	13	21	102	69	24.1
Berlin, 1,225,065	7,694	2,825	478	617	85	40	125	34	4	909	25.1
Hamburg, 486,678	3,111	1,004	364	109	35	24	51	25	..	209	25.6
Dresden, 236,000	1,505	403	130	107	25	6	24	9	..	55	29.7
Munich, 240,000	2,002	770	174	46	25	18	40	2	..	291	33.2
Leipzig, 164,636	1,001	342	82	96	13	4	11	3	2	44	24.3
Kœnigsburg, 154,000	1,142	421	123	40	54	...	4	15	..	118	29.6
Bucharest, 200,000	1,446	428	238	66	22	11	4	34	..	127	28.9
Paris, 2,239,928	14,627	1,978	1,505	626	43	512	131	472	19	838	26.1
Buda-Pesth, 416,474	4,044	1,121	641	58	15	88	24	28	22	381	38.8
St. Petersburg, 928,016	8,838	2,888	1,169	239	125	624	71	307	45	1,208	47.6

EDITOR'S TABLE.

HOW SHALL OUR HOUSES BE WARMED AND VENTILATED?

Coincident with the studied presentation of the subject of ventilation and warming on other pages of this number, we are gratified with the opportunity of inviting attention to the various means submitted in our advertising pages for fulfilling the required conditions. But it should be constantly borne in mind, that however excellent the means offered they should not be restricted to half-way measures. It is the misfortune of many people that in the adoption of means for warming their houses they entirely neglect the very first principle of ventilation—that it is accomplished by heat. Hence instead of adopting adequate means for both warming and ventilation, they are all the while dabbling into the details of atmospheric constituents, as if these were in constant danger of separation and must be dealt with piecemeal, instead of making efforts for maintaining equability of the atmospheric constituents by imitating nature's method. All the currents in the free atmosphere are produced by differences in temperature. This is beautifully illustrated at the sea-shore, as observed in the land and sea-breezes: the air coming off the heated land in the evening, and returning to it again when it has become cooled. Whatever the method of heating, if we would have a healthy atmosphere a current and counter-current must be established between the heated room and the cold air outside, and it must be adapted to the *whole* air of the space to be warmed, not to the puerile notions of the heavier carbonic gas and organic emanations: *keep the air moving* and there will be no need for considering such details. Heat is the motive power of the atmosphere. It is obvious, therefore, that the means of heating should always be amply sufficient for the equally essential purpose of ventilation. And that kind of economy which strains at the expenditure of fuel for efficient ventilation, as well as warming, is sure to find its reward in the promotion of sickness.

PROGRESS OF CHOLERA.

Since the first appearance of cholera in France up to the time of this writing, there have been about seventeen hundred deaths. In Italy, during a much shorter period of time there have been nearly thrice as many, and there are but slight indications of abatement. There have been a few cases in Spain. Quarantines appear to have had no effect in stopping its progress, while the French cities have been well-nigh rid of it by persistent cleansing. Notwithstanding, United States Consul-General C. M. Wood, at Rome, under date of September 15th, made the following communication to the State Department, Washington:

In consequence of the quarantine, commercial intercourse with foreign countries is nearly suspended, while Sicily and Sardinia are cut off from the other parts of the kingdom. Besides the great loss to foreign commerce, it is estimated that about four hundred thousand persons will be prevented from visiting the country this season. The pecuniary loss to the country in general is incalculable. Since the outbreak of cholera in several parts of the kingdom there has been much doubt expressed by the press and interested parties on the mainland as to the efficiency of the quarantine, but in Sicily public opinion is more than ever in favor of it, and it has there, as well as in other islands, been extended from ten to twenty-one days.

STATE BOARDS OF HEALTH REPORTS.

MICHIGAN.— *Text-books on Physiology and Hygiene.*—At the regular meeting of the Michigan State Board of Health, July 8, 1884, the following resolution was adopted:

Resolved, That while we cannot recommend, without qualification, any of the books presented to this Board for examination, with the exception of those already acted upon, on account of numerous and important errors and omissions, the following works seem to us to be admissible for use in the schools, although we consider it important that the errors referred to should be eliminated as speedily as possible, and that without such correction none of the works named can receive the entire approval of this Board:

1. "Physiology and Hygiene." By J. C. Hutchison, M.D.,

LL.D. New York: Clark & Maynard, publishers. Edition of 1884, with Supplement on Stimulants and Narcotics.

2. "The Laws of Health: Physiology, Hygiene, Stimulants, Narcotics." By J. C. Hutchison, M.D., LL.D. New York: Clark & Maynard, publishers.

3. "Hygienic Physiology, with Special Reference to the Use of Alcoholic Drinks and Narcotics." By J. D. Steele, Ph.D. New York and Chicago: A. S. Barnes & Company, publishers.

4. "Lessons on the Human Body: An Elementary Treatise upon Physiology, Hygiene, and the Effects of Stimulants and Narcotics on the Human System." By Orestes M. Brand. Boston and New York: Leach, Shewell & Sanborn, publishers.

5. "First Lessons in Physiology and Hygiene, with Special Reference to Alcohol, Tobacco, and other Narcotics." By Charles K. Mills, A.M., M.D. Philadelphia: Eldredge & Brother, publishers. 1884.

6. "Elements of Physiology and Hygiene." By R. T. Brown, M.D. Cincinnati and New York: Van Antwerp, Bragg & Company, publishers.

7. "The Eclectic Physiology for use in Schools." By Eli F. Brown, M.D. Cincinnati and New York: Van Antwerp, Bragg & Company, publishers.

At the meeting of this Board April 8, 1884, the book entitled "The Human Body: An Elementary Text-book of Anatomy, Physiology, and Hygiene." By H. Newell Martin, D.Sc., M.A., M.D. Second Edition, revised. To which is added a special chapter on Alcohol and Narcotics. New York: Henry Holt & Company. 1884—was approved unqualifiedly. The book entitled "Alcohol: Its Effects on Body and Mind." By Eli F. Brown, M.S., M.D. Indianapolis, Ind.: Normal Publishing House. 1883—was approved with the qualification that "it contains a few inaccuracies."

Cheese-Poisoning.—The Secretary presented a report on four outbreaks of cheese-poisoning in Michigan during May and June, namely, at Middleville, Jerome, Jonesville, and Big Rapids. All persons who ate of the cheeses were taken sick (in all about one hundred and sixty-four persons) with the same symptoms, *i.e.*, pain and burning sensation in stomach,

intense vomiting and purging, feeble pulse, cold extremities, and tendency to collapse. All finally recovered. The cheeses were ordinarily good-looking samples, but when cut or broken a liquid oozed into the pores. In each case the cheese was made at the factory of G. B. Horton, Fruitridge, Lenawee County, Mich.

Dr. V. C. Vaughan, Committee on Foods, also read a report on cheese-poisoning. At the request of the Secretary he had visited the factory in Fruitridge, and had analyzed specimens of the cheese. Everything about the factory appeared to be scrupulously clean, and nothing in vats, cans, or surroundings offered any explanation of the cause of the poisoning. Analysis showed no arsenic, copper, lead, iron, or other mineral poison. When the cheese was cut or broken a whitish liquid oozed into the pores, and in this liquid microscopic organisms were detected. The liquid was very strongly acid. For more than one hundred years the attention of the scientific world has been drawn to the subject of cheese-poisoning by repeated outbreaks of this sort in this country and in Europe. Much has been written on the subject, and many investigations carried on, especially in Germany. It has been variously ascribed to diseased milk, decomposition and the development of certain fatty acids, etc., but we do not yet know what makes the cheese poisonous. The manufacturer said the cheese which produced the ill results was all made between April 26 and May 26, 1884. It was made in the same manner and with the same care as other lots, which had given no cause for complaint. Good cheese is only very slightly acid, and slowly reddens blue litmus paper. The poisonous cheese was intensely acid, instantaneously reddening blue litmus when the paper was applied to the freshly cut surface. This test for poisonous cheese appears to be practicable. The blue litmus paper could be applied by any grocer to each freshly cut cheese. If the litmus paper is instantly turned red by the liquid which oozes into the pores, the cheese is to be suspected as poisonous. Dr. Vaughan's report will be published in the next Annual Report of this Board.

Small-pox, the Secretary reported, was brought into Rose Lake Township, Osceola County, Mich., June 9, 1884, by a German immigrant who, with his wife and three children,

landed in New York, June 4th, by steamer Weser, Weiser, or Wieser. The immigrant says that on the passage over there were on that vessel three deaths from small-pox, and several cases that recovered. The immigrant was taken sick June 13th, and was attended by Dr. Bettes, of Le Roy village, in the adjoining township of Le Roy, who could not know the true nature of the disease till the eruption took place, soon after which Dr. Bettes himself came down with the disease, and has since died. The health authorities of Le Roy village had neglected to appoint a health officer as the law requires, because they thought they would "save a health officer's salary by doing without one." Dr. .W J. Law was then appointed health officer, and he seems to have done very efficient work, as did also Mr. Bryan Monaghan, health officer of Rose Lake Township. The townships of Rose Lake and Le Roy united in the construction of two hospitals, which were built June 29th. At last report there were ten cases in the hospitals, five cases at Tustin, and one at Cadillac.

This outbreak is another illustration of how Michigan and the Northwest suffer from the lack of a careful immigrant inspection service, such as was planned by the National Board of Health and for a time carried on, but discontinued for want of an appropriation.

The next regular meeting of this Board will occur October 7, 1884, instead of the second Tuesday in October, which would be its regular time.

Reports of vital statistics for month of August, 1884, compared with the same month in the six years 1877–82: Erysipelas, rheumatism, and bronchitis were more prevalent, and remittent fever, intermittent fever, dysentery, and cholera morbus were less prevalent in August, 1884.

Meteorological reports for the corresponding period show that the temperature was lower, the absolute and the relative humidity and the day ozone were less, and the night ozone more.

NEW YORK.—Monthly bulletin for July reports infant mortality largely increased, the proportion being for the State 33.4; the increase has fallen almost entirely on the city population. From diarrhœal diseases, which represent most of the

increase, the percentage of deaths is 30.5 ; in June it was 13.68 ; in April, 1.60 per cent. of the entire mortality.

RHODE ISLAND.—The Sixth Annual Report of the State Board, for the year ending December 31, 1883, including the Report upon Births, Marriages, and Deaths in 1882, is a pamphlet of 347 pages. Population (1880), 276,531. Births, 6,825 ; marriages, 2,634 ; divorces, 271 ; deaths, 5,074. Of the births, marriages, and deaths there is but slight variation from the average for a comparative period of twenty-nine years. To every 100 living births, 84.56 marriages and 69.71 deaths ; and of the whole number of births, one in every 26.4 was still-born : 2,915 of the births were of American, 2,788 foreign, 1,122 of mixed American and foreign, and 179 of colored parentage.

Estimates for a period of twenty-five years show a continuous decrease in the proportion of births of American, and a corresponding increase in foreign parentage, of about five respectively for that period of time. Of the marriages there was one for every 52.49 of the population.

Estimating a probable increase of population for the two years—1880–82—to 295,000, the death-rate was 17.2 per 1,000 ; about the average for the last five years. Of the total number of deaths 30.5 were of children under five years of age. The average age of all was 31.88.

Of the chief causes of death, consumption had a larger number of victims than in any previous year—737, or 14.52 per cent. of the whole number, but 1.31 per cent. less than the average for thirty years and seven months. Pneumonia and congestion of the lungs, 344, 6.76 per cent., .74 per cent. more than the average. Fevers, 229 (213 typhoid), 4.51 per cent., .80 per cent. larger than the average, and larger than in any year since 1865. Diphtheria, 101, less than one-half the number for 1881, and largely less than in any previous year since 1875. Diarrhœa and dysentery, 158—a little less than the average. Scarlet fever, 45—with a single exception the smallest number for twenty-eight years.

Divorces applied for during the year, 339, of which 271 were granted—in the proportion of 9.7 to the number of marriages ; larger than in any previous year except in 1879, when the proportion was the same.

By the monthly returns of medical correspondents throughout the State, which are summarized for 1883, "the zymotic diseases of usual occurrence and of largest fatality had a diminished prevalence. . . . A large prevalence of malarial influence was reported from twelve towns, an equal prevalence with the previous year from four towns, and a diminished prevalence in seven towns. From thirteen towns no indigenous cases were reported."

Reports from town clerks in regard to public sanitary improvements (under the statute which makes it the duty of the Secretary to "make inquiry from time to time of the clerks of the towns and local boards of health . . . in respect to acts for the promotion and protection of the public health," etc.) show a little progress in Newport, by an ordinance establishing the office of a city engineer, and making some progress in sewering the city; providing gratuitous vaccination, and improved contracts for the more efficient removal of garbage. The health officers of the city consist of a City Physician, Inspector of Nuisances, and Health Officer, the first only being an M.D., and all subservient to a committee of the City Council—no board of health. Bristol Town Council adopted an ordinance for the suppression and prevention of nuisances, but has no board of health besides the Town Council. Johnston passed an ordinance concerning nuisances, but, like Bristol, has no board of health besides the Town Council to see to its enforcement. Pawtucket has extended its sewers and increased its water supply, but has a so-called health service similar to that of Newport. Providence has manifested a greater interest in questions pertaining to the means of preserving general health than at any previous time. The question of a pure water supply, extension of sewerage, sanitary condition of public buildings, particularly the public schools, have all been subjects of official action; and the citizens generally manifest an increased interest in public sanitation. Scituate has adopted an ordinance requiring a physician's certificate of cause of death before burial, and Woonsocket an ordinance regulating the hours for removing the contents of vaults and cesspools; but they are both in the same category as over twenty other towns in the State—without boards of health.

The Secretary makes a special report on his own personal inspection of

Summer Hotels.—"Rhode Island has deservedly a more than national reputation for the superior excellence and large number, in proportion to its territorial dimensions, of its places for summer resort. The attractions are varied and unique. . . . Nearly the whole length of the eastern boundary of the State furnishes localities upon or in the near vicinity of tide-water which are unsurpassed for quiet, beauty, and picturesqueness of scenery and salubrity of the atmosphere."

At Narragansett Pier and Watch Hill more than half of the hotels were found to have pan-closet and other dangerous fixtures; leaching cesspools, more or less in dangerous proximity to water cisterns and wells.

At Block Island the arrangements in general were a little better. But here, for the smaller hotels and boarding-houses especially, "the privy-closets outside the houses have vaults which are simply shallow holes or slight depressions in the ground, and in some of which the rain-water from the roofs and surrounding grounds finds access, and sinking through the contents of the vaults and into the earth beneath, carry with it some of the foul material, and so saturating and contaminating all the earthy strata which it reaches. The results are the same as in the case of cesspools."

Notwithstanding, this inspection report concludes with the statement that "improvements are made in every direction from year to year, and sanitary appliances and sanitary management are receiving full attention." This statement, we regret to say, is not sustained by the results in the report before us. With the single exception of Providence, there has been little or no progress in sanitary appliances in Rhode Island for several years. The ratio of diseases from preventable causes—such as those found in relation with the summer hotels, which may be taken as a fair index of similar local conditions of private houses—has scarcely diminished any for ten years, while in some—typhoid fever and malarial diseases—the ratio has notably increased.

Substantial sanitary improvement in the summer hotels of Rhode Island, as elsewhere, will scarcely take place until their proprietors are obliged by law to have some regard for the

health and lives of their guests. When *all* hotels are required, as they should be annually, to have certificates of good sanitary condition by competent authority, before license, improvement may reasonably be expected.

About one life a day is lost in the United States by steam-boiler explosions, notwithstanding the required inspection certificates. How many would be lost without such requirement is problematical only, but inferentially certainly not less than ten times as many. To assert that the danger of hotels—particularly those which come under the head of summer resorts—with their present appointments is more dangerous to health and life than steam boilers, would surprise no one who has given attention to the subject. On the contrary, it would be a very moderate estimate. It is fit that all State sanitary authorities should urge that conditions such as those described in the report before us are criminal, because dangerous to life; and that, for their prevention, no hotel should be licensed without a certificate of good sanitary condition, under State authority.

THE AMERICAN PUBLIC HEALTH ASSOCIATION.

Twelfth Annual Meeting will convene in LiederKranz Hall, southeast corner of Thirteenth Street and Chouteau Avenue, St. Louis, Mo., Tuesday, October 14, 1884, at 10 A.M., and continue four days. The arrangements are to have *two* sessions daily: from 9.30 A.M. to 2.30 P.M., and from 7 to 10 P.M.

Papers have been promised for this meeting as follows: on I. *Hygiene of the Habitations of the Poor*, Major Samuel A. Robinson, Inspector of Plumbing, D. C.; Charles W. Chancellor, M.D., Secretary State Board of Health, Maryland; William K. Newton, M.D., Health Officer, Paterson, N. J. II. *Hygiene of Occupations*, George H. Rohé, M.D., Professor of Hygiene, College of Physicians and Surgeons, Baltimore, Md.; Walter Wyman, M.D., Surgeon U. S. Marine Hospital Service; J. W. Chambers, M.D., Baltimore, Md. III. *School Hygiene*, Samuel W. Abbott, M.D., Secretary State Board of Health, Massachusetts; Edward M. Hartwell, M.D., Johns Hopkins University; Stephen O. Richey, M.D., Washington, D. C.; Felix Formento, M.D., New Orleans, La. IV. *Adul-*

teration of Food, Hon. Erastus Brooks, Member State Board of Health, New York; Prof. H. B. Cornwall, Princeton College, N. J.; Charles E. Monroe, S.B., Professor of Chemistry, U. S. Naval Academy, Annapolis, Md.; Prof. V. C. Vaughan, M.D., Member State Board of Health, Ann Arbor, Mich.; J. Chesston Morris, M.D., Philadelphia, Pa. V. *Water Pollution*, Major Charles Smart, M.D., Surgeon U. S. Army and Member of the National Board of Health; Thaddeus M. Stevens, M.D., Indianapolis, Ind.; Henry M. Baker, M.D., Secretary State Board of Health, Michigan. VI. *Disposal of Sewage by Irrigation or Chemical Action*, Henry P. Walcott, M.D., Member of State Board of Health, Lunacy, and Charity, Massachusetts; George N. Bell, C.E., Newport, R. I.; W. John Harris, M.D., St. Louis, Mo. VII. *The Observable Effect upon the Public Health of Official Sanitary Supervision* (Cremation), Rev. John D. Beugless, Chaplain U. S. Army, Brooklyn, N. Y. VIII. *The Work of Municipal and State Boards of Health.* IX. *On Disease Germs*, Major George M. Sternberg, M.D., Surgeon U. S. Army; L. Bremer, M.D., St. Louis, Mo.; W. W. Vinnedge, M.D., Member State Board of Health, Lafayette, Ind.; W. H. Stillwell, M.D., Humboldt, Tenn. X. *Heating and Ventilation*, Charles O. Curtman, M.D., St. Louis, Mo. XI. *Protective Spectacles*, Adolphus Alt, M.D., St. Louis, Mo. XII. *Syphilis*, J. D. Gatch, M.D., Lawrenceburg, Ind. XIII. *A Survey of the Present Sanitary Situation in St. Louis*, Being a series of short papers on leading public health topics, contributed by city officials and local sanitarians: (*a.*) The Situation, Soil, and Surroundings of St. Louis, considered from a Hygienic Standpoint, H. Flad, C. E., President Board of Public Improvements. (*b.*) Organization of Health Department, Sanitary Legislation, and the Abatement of Nuisances, John D. Stevenson, M.D., Health Commissioner. (*c.*) Sources, Quality, etc., of the Milk and Meat Supplies of St. Louis, Joseph Spiegelhalter, M.D., and J. E. Cabanné, Esq. (*d.*) Street Paving and the Public Water Supply, Thomas J. Whitman, Water Commissioner, and J. W. Turner, Street Commissioner. (*e.*) On the Average Temperatures and Prevailing Climatic Conditions of St. Louis, Prof. X. E. Nipher, Washington University. (*f.*) Public Sewerage and House Drainage, Robert Moore, C.E. (*g.*) The Leading Local (pro-

ductive) Industries, and their Effect on the Health and Lives of their Operatives, George Homan, M.D. (*h.*) The Infant and School Populations and Existing Causes unfavorable to their Health, J. P. Kingsley, M.D. (*i.*) The Chief Local Factors in the Causation of Disease and Death, R. Lencloking, M.D.

Full reports are expected from all committees.

The headquarters of the *Executive Committee* will be at the *Southern Hotel.* The first meeting of the committee will be held on Monday, October 13th, at 4 P.M.

The National Conference of State Boards of Health will meet at LiederKranz Hall on Monday, October 13th, at 2.30 P.M.

The subjects for each day's consideration will be stated the previous day, and an official programme will appear each morning. Ample time for discussion will be allowed under the rules of the Association, and all discussions will be stenographically reported.

All papers offered the Association become its exclusive property, will be copyrighted, and can only be published (except in the volume of Transactions of the Association) by consent of the Executive Committee. All papers should be in the hands of the Secretary by October 12th, in order to receive the approval of the Committee. After October 5th all communications to the Secretary should be sent to St. Louis, Mo.

LITERARY NOTICES.

WATER SUPPLY AND SEWERAGE.

Report of Chief Engineer William Ludlow, Philadelphia Water Department, for the year 1883. *Pp.* 352.

Report of City Engineer H. M. Wightman, Boston. Seventeenth Annual Report for 1883.

Report of Ernest Poutzen, C.E., May, 1884. *L'Assainissement suivant le Système Waring. Paris.*

THE above Reports, each in its way of special interest as bearing on sanitation, yet cannot be noticed here further than by reference to salient points and in a general way, in their order.

The Report of the Chief Engineer of the Philadelphia Water Works is a remarkable document, not more from the interesting facts which it brings to our notice, than from the vigor and boldness displayed by its author in handling a delicate subject, and the disregard shown to personal consequences when in the performance of what he considers his duty in the execution of trusts committed to his keeping. The department of which he has but lately been put in command, he finds has for years been hampered by outside influences, which he declares his determination to disregard ; and in his conduct of affairs committed to him, and in the selection of his subordinates, the good of the service and the merits of individuals shall be his only guide—thus striking at the very root of evils which have heretofore marred the efficiency of many of our public offices.

Chief Engineer Ludlow gives in detail the condition of the various branches of the work, from which we gather not only that repeated recommendations of his predecessor were disregarded by the Councils, but that the works had been allowed to deteriorate and run down to an alarming degree. This, the disagreements upon all points, including, first and foremost, political differences, and underhand management to thwart the efforts of his predecessor to achieve greater efficiency, was well known as a possible cause, but this could be no excuse for the slovenly, slip-shod, and inefficient method of repairs, and the general neglect, resulting in absolute filthiness of condition of small things, which, in their aggregate, was disgraceful in the extreme in the works of a great city, and which was the condition of things on his assuming charge. A statement of the receipts and expenditures of the Water Department for the twenty-eight years from 1854, shows a surplus of collections over expenditures of $8,152,356, while for the eleven years last past, embracing the ten years of the management of his predecessor, there was an average annual surplus of over $550,000, or sixty-six per cent. of the expenditures. Mr. Ludlow remarks upon this as follows :

" Whatever may have been the causes of the extraordinary and prolonged neglect and consequent dangerous decadence (elsewhere adverted to), of a service established for the benefit of the citizens, and holding such intimate relation to the com-

fort, health, and prosperity of the entire community, the above statements from the records of the Department make it sufficiently evident that a lack of funds properly and equitably applicable to its necessary support and enlargement, in proportion to the growth and requirements of the city, was not among them. . . . . The appropriations for necessary improvements were withheld year after year, while the heavy annual surplus collected from citizens was used for other and less important improvements."

Additional engines, boilers, etc., and extensive repairs have been made, and others contracted for. The defect at present being a lack of storage room, by which the turbid water when pumped has no time to settle, but must be at once delivered to consumers, is noticed, and in addition to the completion of the East Park Reservoir, the Cambria Basin is recommended, which together will total nearly one thousand millions of gallons capacity, at a cost of about $2,000,000, in addition to the existing reservoirs of a capacity of 191,250,000 gallons.

A thorough reinspection of the entire city has been made, embracing over 160,000 properties as a basis for water-rates, resulting, it is estimated, in over $200,000 additional revenue already. Cost of the reinspection, some $10,000.

The additions to the pumping engines will enable them to raise a daily average of 90,000,000 gallons. The distribution is defective, the inheritance from earlier times of small pipes less than 6 inches in diameter, amounting to 150,000 feet, in a total length in the old city of 490,000 lineal feet, much of which, some 90 per cent., having been laid from thirty to sixty years. The receipts for 1883 were $1,627,000. The gross profits for the year being about $580,000.

Of 70 gallons per capita supplied, it is estimated that but 40 gallons were used, and 30 gallons wasted. The waste, estimated at 26,000,000 gallons daily, being determined by the results of experiments with the Bell waterphone. The cost of pumping and distribution estimated at $6\frac{7}{100}$ cents per 1,000 gallons.

Referring to the quality of the water, the Chief Engineer condemns the Kensington supply from the Delaware River as unfit for human consumption, and the Frankford supply as by

no means above suspicion. The condition of the Schuylkill supply (four pumping stations out of six) very naturally demanded his attention, and he shows that, as the natural sewer for a population of at least 350,000, largely engaged in manufacture, it is very certain that at times "the most convincing evidence has been shown of the inability of the river to digest or dispose of the extraneous and injurious matters discharged into it." Mild terms certainly. Elsewhere he says: "Unless means can be found and applied to effectually cut off or thoroughly neutralize the multiplied sources of pollution, it is hopeless to consider it available in the future for drinking purposes." He despatches very cleverly the arguments in favor of filtration as a remedy for pollution in drinking water, and of the advocates of artesian wells, and finally reaches the only practical and radical solution of the question of a future supply, by drawing the water from a source which can be traced and protected, from its springs in the mountain to the consumer in the city; and as an earnest of this, the efforts he is now making to examine minutely and exhaustively all the possible sources of supply of a pure water are given somewhat in detail, embracing a topographical and geological survey of the water-shed under the immediate direction of Mr. Rudolph Hering, covering an area of about 6,500 square miles of general examination, 468 square miles of detailed survey, and 183 miles of conduit line. A preliminary report of scientific interest is appended from Prof. Albert R. Leeds, of chemical investigations and results reached through his well-known painstaking and careful methods of analysis.

The entire department has been reorganized and remodelled, and in the matter of employment of subordinates of all grades and their individual responsibilities, there is every reason to believe that the maximum of efficiency has been reached through Mr. Ludlow's vigorous efforts, and much good may be anticipated elsewhere from the example afforded by his success.

The report before us stands alone, so far as we know, among papers from the head of the Water Department, by its treatment of the sanitary aspect of the question of the future water supply; and while others have been content mildly to suggest that the balance of opposing elements for mischief in

mild sewage, when used as a beverage, either "with or without Fairmount ice," may not, as now, always be preserved, he has had the courage of his convictions, and has given his constituents the benefit of them, and which it is to be hoped they will benefit by.

Philadelphia has long fostered what is there considered as a proper spirit of conservatism against innovations upon long-established methods; the sooner they are rid of this, as standing in the way of true sanitary reform, the better condition they will be in to meet emergencies possible in all great cities.

Boston has a population of 428,000, with a water supply of near 40,000,000 gallons daily—or an estimated average of eighty-nine and a half gallons per capita, and from the results of inspections by the Deacon and recording metres, it is anticipated that the waste will be so far reduced that the average consumption will not exceed sixty gallons daily per head of the population.

It is sewered by the combined method, that is to say, the house drains discharge into the street sewers and carry with them all storm waters from the roofs and yards, the street sewers in addition taking such proportion of the street drainage as is enabled to reach them through the street basins. The street sewers are of irregular section, and many of them are imperfectly designed, the legacy from earlier days. Such sewers as empty into tide water, which is largely the case, are furnished with tide-gates at their outfalls, which retain their contents during high tide; this has resulted in much inconvenience, and in 1876, a commission was appointed to consider the subject, which resulted in recommending a system of intercepting sewers, which, encircling the city, received the discharge of the city sewers, and conveyed it to a reservoir and pumping station on the coast, where it was to be elevated by pumps some thirty-five feet, and carried by a tunnel under Dorchester Bay to Moon Island in the harbor, to be received by a reservoir, and by regulating gates discharged at ebb tide into the harbor, about five miles from the city. This scheme was adopted, and at an expense of something over $5,000,000 has been carried out, and is now in successful operation, over

20,000,000 gallons daily having been pumped since January 1st, of this year.

Great skill has been shown in the arrangement of the works, and in the mechanical appliances which became necessary for their uninterupted action, and the entire sewage of the city of Boston is now sent into the Lower Bay, and experiments instituted for the purpose show that its dilution is so complete that no evidence of any return sewage is apparent to either of the senses.

The engineer states that the improved sewerage was designed to remedy two serious evils in the old system of sewerage; first, the damming up by the tide of the city sewers, by which during the greater part of the day they were converted into stagnant cesspools; and second, the discharge of sewerage on the borders of the city, causing nuisance in the vicinity of population. And he further states, that the system is not designed to prevent wet cellars, by receiving the water due to heavy rains; no sewers or pumps which it would be practicable to build would be of sufficient capacity for that purpose. Incidentally the new system will afford considerable relief during moderate storms. But the evils due to defective house plumbing will not be remedied by the new works, except that the pipes will not hereafter be subjected to the action of gases compressed by the daily filling of the city sewers.

These works have been designed and carried out on the principle that if you can get rid of human refuse, even at a cost, it is true economy in a sanitary point of view, in large cities situated on the coast, to so dispose of it, rather, than with our present knowledge of the subject, to attempt its utilization. In direct contrast with this view, we have the latest improvement in Paris.

Paris, with a population of about two and one-third millions, has a water supply estimated at forty gallons per head. It has a system of street sewers, the smallest high enough for a man to stand upright in, and when in streets less than sixty-six feet in width, the sewer is in the centre of the street; where the street is wider, there are two sewers, one under each sidewalk. There are three hundred and fifty-five miles of these sewers with their branches, and confined exclusively to carry-

ing off the rainfall and the washing of streets, together with the house waste; the contents of water-closets being discharged into cesspools of various constructions on the premises, and cleaned at intervals by buckets and carts. The heavier part of the material in the main sewers is also, by means of rail trucks or boats, taken out by hand, and when suitable, converted into poudrette. The maximum rainfall is assumed as 1.77 inch per hour, one-third of which is estimated to reach the sewers in an hour.

Notwithstanding house sewage is excluded from the sewers, many of them are very offensive. Others are very clean, and constitute one of the sights of Paris, to be visited by strangers under certain regulations. It has been under consideration to utilize the entire sewage of the city by using it for irrigation, some 12,000 acres being estimated as available for that purpose. The city, it will be perceived, is well drained, but not sewered.

According to M. Poutzen, our countryman, G. E. Waring, Jr., having successfully sewered Memphis, Tenn., and other cities in the United States, among which we learn for the first time is Buffalo, in this State, and his plan also being under advisement for New Orleans and New York, bethought him of Paris, and obtained authorization for the introduction of his method in the quarter "du Marais," July, 1883.

The Rue Vieille-du-Temple, sixteen hundred feet in length, and a branch to the Hospital Saint-Gervais, and one in Rue Quatre-Fils to the schools in that street, constitute the length to be sewered, which is effected by placing a six-inch pipe in the existing brick sewer fixed to the sides, and so accessible, the fall being from the top of the sewer to the bottom at its junction with the Rue de Rivoli, where it discharges. There are several large schools, a hospital, and public latrines, all said to have been very offensive, and used by about two thousand individuals daily, as also the animals on the street. There are five of Fields' flushing tanks provided, of a capacity of about six hundred and thirty-three gallons, which empty themselves three times daily, or altogether nineteen hundred gallons. The dwellings on the streets still discharge their water-closets into the cesspools as formerly. But we gather from M. Poutzen's report that the result of this trial, for the six months it

has been in operation, has been so satisfactory that it is probable it will be extended so far as to connect all house-drains with the separate pipe placed within the main sewer, where a discharge direct into the sewer is not desirable, and thus convey it to such sewers as, from their condition, will admit of its further carriage by means of the main sewers themselves to their outlets.

He closes with the remark, "that the establishment and maintenance of a system of sewers according to Waring's system, has, therefore, in all cases, the advantage of being economical." The plan, with details to scale, is well illustrated, and we doubt not, if confined to localities as shown, it will serve a good purpose as an adjunct to a combined system of water-carriage sewerage.

As well shown by the leading paper in our previous number, the separate method is applicable in certain localities, and where the manufacture of fertilizers is a recognized factor in the case; but as in the present case, in Paris, it does nothing, and can do nothing toward perfecting the sewerage of the city as a whole. So much of the city sewage—the great body of it—as is not converted into poudrette, or used on the sewage farm, will continue to find its way into the sewage-laden waters of the Seine, until some much more radical and complete change is effected than that which is represented in this report.

ANATOMY, PHYSIOLOGY, AND HYGIENE: A Manual for the use of Colleges, Schools, and General Readers. By Jerome Walker, M.D., Lecturer upon Anatomy, Physiology, and Hygiene at the Central High School, Brooklyn, and upon the Diseases of Children at the Long Island College Hospital; Physician to the Brooklyn Society for the Prevention of Cruelty to Children; Consulting Physician to the Keith Private Home for Nervous Diseases, and Senior Physician to the Seaside Home for Children, Coney Island. 12mo, pp. 427. With numerous original and carefully selected illustrations. New York: A. Lovell & Co.

This is the *fifth* of the books on the same subject, recently noticed in THE SANITARIAN, all aiming to fulfil the requirements of recent laws in several States for the study of the elements of physiology and hygiene in the public schools, and with partic-

ular reference to stimulants and narcotics. The author of this manual has possessed an important advantage over the authors of the other books on the same subject, in that he has not only possessed the essential scientific requirements for the production of such a work, but has had several years' practical experience in the application of such knowledge in the school-room. The benefit of this practical knowledge is clearly apparent. With no attempt at other originality than such an arrangement of his matter as to render it the most easily comprehensible, he has succeeded in divesting it of unnecessary technicalities and investing it with adaptability far in advance of any of the other school-book physiologies which have fallen under our observation. But it might have been improved still more by curtailing the anatomy, particularly the chapters on the nervous system and nerve force, and giving instead a chapter on rest and relaxation, subjects on which school-teachers, as well as children, are generally deficient.

The effects of alcohol and its congeners, tobacco and narcotics, are concisely stated in accordance with the generally accepted physiological doctrines, with citations from authorities: never necessary in a state of health, rarely beneficial and frequently injurious, but sometimes valuable as medicinal agents.

To the general text is appended fifty pages of "notes," which consist of citations from authorities sustaining the author on all questionable subjects. These and numerous foot-notes throughout add materially to the interest and value of the work.

"The size of type and the color of paper," we are informed, "have been adopted in accordance with the advice of Dr. C. R. Agnew, the well-known oculist. Other eminent specialists have carefully reviewed the manuscript and proof of the chapters on the nervous system, sight, hearing, the voice, and emergencies, so that it may justly be claimed that there is here a better presentation of these important subjects than can be found in any other school physiology."

The cuts are variable in quality; some, chiefly those which are original—for example, the skin—are excellent. Others have the appearance of being selections from over-used plates and are bad. Questions and analysis conclude each chapter, adding to its convenience and utility as a text-book.

A MANUAL OF DISEASES OF THE THROAT AND NOSE, INCLUDING PHARYNX, LARYNX, TRACHEA, ŒSOPHAGUS, NOSE, AND NASO-PHARYNX. By Morell Mackenzie, M.D., London, Consulting Physician to the Hospital for Diseases of the Throat; Lecturer on Diseases of the Throat at the London Hospital Medical College, and Corresponding Member of the Imperial Royal Society of Physicians of Vienna.

Vol. II.—DISEASES OF THE ŒSOPHAGUS, NOSE, AND NASO-PHARYNX.

A TEXT-BOOK OF PATHOLOGICAL ANATOMY AND PATHOGENESIS. By Ernst Zeigler, Professor of Pathological Anatomy in the University of Tübingen. Translated and edited for English students by Donald MacAlister, M.A., M.B., Member of the Royal College of Physicians; Fellow and Medical Lecturer of St. John's College, Cambridge.

Part II.—SPECIAL PATHOLOGICAL ANATOMY; Sections I.–VIII. New York: Wm. Wood & Co.

These are the August and September volumes of "Wood's Library of Standard Medical Authors," uniform with preceding volumes for the current year, and faithfully sustaining all the conditions on the part of the publishers for the production of standard works. The preceding companion Volumes I., respectively, of these may be found noticed in THE SANITARIAN, vol. ix., p. 46, and vol. xi., p. 559, of the series for the years 1881 and 1883. All that is said of those volumes is compounded in these. Whatever the impatience of readers for the completion of the respective works, the interval has evidently been profitably used by both authors in sifting the wheat from an enormous amount of chaff which has appeared in recent periodical literature on the subjects treated of, and the "Library" has been made all the richer for the delay. They are both eminently practical works of value to every physician.

The fiction of the September *Century* includes a romantic tale of Mexican life by Thomas A. Janvier, entitled "Pancha: a Story of Monterey," with three illustrations, one of them the frontispiece to the number, by Mary Hallock Foote; a Southern dialect story, "The Brief Embarrassment of Mr. Iverson Blount," by Richard M. Johnston, author of the

"Dukesborough Tales;" besides the conclusion of "A New England Winter," by Henry James, the middle part of "A Problematic Character," by H. H. Boyesen, and further chapters of "Dr. Sevier," by George W. Cable.

Among the articles in the *North American Review* for September, three in particular merit the serious consideration of every one who studies the tendencies of our Government. The leading one is by Bishop J. Lancaster Spalding, who insists that the only sure "Basis of Popular Government" is morality, not culture of the intellect, nor universal suffrage, nor the development of material resources; and that if the country is to be saved from ruin, there must be a return to the uncompromising moral code of the founders of New England. The policy of "The Exclusion of the Chinese" is advocated by John H. Durst, who presents a striking array of forcible and original arguments against Mongolian immigration. Four distinguished writers on political economy, namely, David A. Wells, Thomas G. Shearman, J. B. Sargent, and Professor W. G. Sumner, set forth, from nearly every conceivable point of view, the "Evils of the Tariff System;" and it is announced that in the *Review* for October several writers of no less distinction will exhibit the "Benefits of the Tariff System." The other articles in the current number are "The Demand of the Industrial Spirit," by Charles Dudley Warner; "Inspiration and Infallibility," by the Rev. Dr. J. H. Rylance; "The Need of Liberal Divorce Laws," by Elizabeth Cady Stanton; and "Our Remote Ancestry," by Professor Alexander Winchell.

PUBLICATIONS RECEIVED.

OUR HOMES AND HOW TO MAKE THEM HEALTHY. By R. Brundell Carter, F.R.C.S.; F. S. B. F. De Chaumont, M.D., F.R.S.; W. H. Coofield, M.A., M.D. (Oxon.); William Eassie, C.E., F.L.S., F.G.S.; Robert W. Edis, B.A., M., Inst. C.E.; Douglas Galton, C.B., D.C.L., F.R.S.; Thomas Eccleston Gibb; Malcom A. Morris, F.R.C.S.Ed.; Shirley Forster Murphy, M.R.C.S; J. Wallace Peggs, C.E.; B. W. Richardson, M.D., LL.D., F.R.S.; Percival Gordon Smith, F.R.I.B.A.; William Squire, M.D.; Keith Downs Young, A.R.I.B.A.; Philip Brown. Edited by Shirley Forster Murphy, Medical Officer of Health to the Parish of St. Pancras; Hon. Secretary to the Epidemiological Society, and to the

Society of Medical Officers of Health. 8vo, pp. 959. With numerous Illustrations. Cassell & Co., London, Paris, and New York.

PRACTICAL TREATISE ON DISEASE IN CHILDREN. By Eustace Smith, M.D., Fellow of the Royal College of Physicians; Physician to his Majesty the King of the Belgians; Physician to the East London Children's Hospital, and to the Victoria Park Hospital for Diseases of the Chest. 8vo, pp. 868. $5.00. New York: William Wood & Co.

PARTRIDGE'S MANUAL OF OBSTETRICS, with 60 Illustrations. $1.00. New York: William Wood & Co.

HEALTH MISCELLANY. Pamphlet, 25 cts. Fowler & Wells, New York.

MICHIGAN STATE BOARD OF HEALTH REPORT, 1883.

PROVINCIAL BOARD OF HEALTH OF ONTARIO, Second Annual Report, 1883.

MEMORIAL SKETCH OF THE LIFE OF J. MARION SIMS, M.D. By W. Gill Wylie, M.D. Reprint from *New York Medical Journal.*

REASONS FOR BELIEVING IN THE CONTAGIOUSNESS OF PHTHISIS. W. H. Webb, M.D. Reprint from *Medical Bulletin,* Philadelphia.

KENTUCKY STATE SANITARY COUNCIL PROCEEDINGS, at Bardstown, March 26–27, 1884.

AMERICAN AND MEXICAN PACIFIC RAILWAY REPORTS, Tofolobampo Harbor, and the Resources along the Line, etc.

DETROIT BOARD OF HEALTH REPORT, 1884.

BOSTON BOARD OF HEALTH REPORT, 1883–84.

PROVIDENCE REPORT OF BIRTHS, MARRIAGES, AND DEATHS, 1883.

UNIVERSITY OF MINNESOTA: College of Medicine, Special Announcement, 1884.

ILLITERACY IN THE UNITED STATES, with an Appendix on National Aid to Education. Charles Warren, M.D., and L. M. Curry, LL.D. Bureau of Education, Washington, D. C.

REPORT OF HEALTH OFFICER OF YONKERS ON ENTERIC FEVER, 1884.

TEACHING, PRACTICE, AND LITERATURE OF SHORT-HAND. By Julius Ensign Rockwell, Stenographer. Bureau of Education, Washington, D. C.

TENNESSEE STATE BOARD OF HEALTH PROCEEDINGS, Quarterly Meeting, July, 1884.

TOLEDO BOARD OF HEALTH REPORT, 1883.

PUBLIC HEALTH LAWS OF ILLINOIS, AND SANITARY MEMORANDA. Illinois State Board of Health.

PROTECTION AND FREE TRADE OF TO-DAY. By Robert P. Porter. 10 cts. James R. Osgood & Co., Boston.

THE SANITARIAN.

OCTOBER, 1884.

NUMBER 179.

THE TRUTH ABOUT STIMULANTS AND NARCOTICS.

WITHIN a short period of time several of our State legislatures have enacted laws requiring that a knowledge of the effects of stimulants and narcotics shall be taught in the public schools. The first effect of these laws has been the publication of a large number of elementary physiologies with special reference to the requirement of the laws, but these books, almost without exception, limit the knowledge they would teach to the partial views of teetotallers and prohibitionists—under whose pressure the laws have been enacted—instead of teaching the *whole* truth, and relying upon the careful education of the senses, as the best, indeed, the only dependence for integrity of character.

The child or youth who is taught only part of the truth on any given subject, and left to the exercise of the will, only half strengthened on the subject at issue, is in more danger of the opposite extreme than he who has not had his mind disturbed by it at all. And, assuming the truth of this proposition, it is difficult to conceive of any subject more likely to challenge the half-educated mind than the use of stimulants and narcotics. To teach that they are poisonous under all circumstances, is to confront a host of witnesses to the contrary, supported by the

highest scientific authorities, and the habits of mankind in all ages.

"A peculiar problem indeed," remarks a celebrated author, "is presented to the psychologist in the remarkable circumstance that wheresoever the human race is found, in the highest condition of civilization as in the first dawnings of culture (with the exception, perhaps, of some races almost more like animals than men), the custom ever exists of transporting themselves by various means into a higher condition of mental activity, which in its excessive and evil phenomena is called drunkenness.

"The maguey wine or pulque of the Mexicans, the palm wine of the Chilians, the beverage prepared from maize by the inhabitants of the countries of the Orinoco and Amazon, lastly, the kumiss of the Tartars, prepared from the milk of mares, all so far resemble our drinks, that in all the intoxicating principle is spirit produced by the fermentation of sugar or starch.

"The action of the cocca, the leaf of an American tree (*Erythroxylon cocca*) is altogether unknown. The greatest enjoyment of the Peruvian *muletero* consists in chewing these leaves and thereby producing a dreamy stupor, in which, without being drunk, but merely in a state of agreeable lassitude, he passes the whole day in inaction.

"The use of the *Amanita muscaria* by the inhabitants of Northern Siberia, the smoking of opium by the southern Asiatics, of the hashish, or hemp-extract, by the northern and southern Africans, and lastly, the drink which the South Sea Islanders prepare from a particular kind of pepper (*Piper methysticum*) are actual narcotic poisons, which by frequent repetition very quickly cause the destruction of the physical frame." *

The maguey wine or pulque of the Mexicans essentially consists of the same property as that which characterized the stimulating and narcotic beverages used by the most enlightened, and equally of similar beverages used by the least enlightened of all nations and people, at all times and everywhere.

Osiris among the Egyptians, Bacchus among the Greeks, and Noah among the Israelites, all appear to have practised,

* Schleiden on the Plant, English Edition, p. 138.

and instructed their fellow-men in the art of producing an intoxicating beverage from the fruit of the vine. Indeed, from all ancient documents, so far as they have been made accessible to modern research, alcoholic fermentation and a knowledge of the effects of its product appear to have been known at a period earlier than that which has left any written traces of its history.

Narcotics are defined by Headland to be those "*medicines* which pass from the blood to the nerves, or nerve-centres, which act so as first to exalt nervous force and then to depress it, and have also a special action on the intellectual part of the brain."

Alcohol clearly comes within this definition, and may be discussed from this standpoint. But, as taught by Anstie, alcohol is a food, medicine, or poison, according to the circumstances under which it is taken, and according to the quantity taken. As a stimulant, in doses not large enough or sufficiently often repeated to produce narcotic effects, it is not only not in conflict with health, but under some circumstances highly beneficial.

"There are times in the life of man when the heart is oppressed, when the resistance to its motion is excessive, and when blood flows languidly to the centres of life, nervous and muscular. In these moments alcohol cheers. It lets loose the heart from its oppression; it lets flow a brisker current of blood into the failing organs; it adds nutritive changes, and altogether is of temporary service to man. So far alcohol does good, and if its use could be limited to this one action, this one purpose, it would be among the most excellent gifts of science to mankind. Unhappily the border-line between the use and the abuse of it, the temptation to extend beyond the use, the habit to apply the use when it is not wanted, overbalance, in the multitude of men, the temporary value that attaches truly to alcohol as a physiological agent. Hence alcohol becomes a dangerous instrument even in the hands of the strong and the wise, a murderous instrument in the hands of the foolish and weak. Used too frequently, used too excessively, this agent (which in moderation cheers the failing body) relaxes its vessels too extremely, spoils vital organs, makes the course of the circulation slow, imperfect, irregular,

suggests the call for more stimulation, tempts to renewal of the evil, and ruins the mechanism of the healthy animal before its time for ruin, by natural decay, should be at all near." These are words of wisdom from one of the foremost authors on the preservation of health, and an uncompromising opponent of the use of alcoholic liquors—Dr. Benjamin Ward Richardson ("Diseases of Modern Life," p. 223).

In all that is here said by Dr. Richardson, on the utility of alcohol under certain circumstances, and its danger under certain other circumstances, there is no room for disagreement. It is, to say the least, sometimes an exceedingly useful stimulant and tonic, if not, indeed, an unquestionable nutrient. And that all persons should deny themselves the use of alcoholic liquors because there are some, ay, even many persons, who do not use their senses, would be a surrender of the wise to the foolish. For it is *not* to the "strong and the wise" that alcohol is a dangerous instrument, and therefore with them it may be safely left for the benefit of themselves and other needful persons, whose health and free agency should not be sacrificed out of consideration for the unwise and debased.

Moreover, in considering the physiological relations of alcoholic beverages, as remarked by Dr. Edward Smith in his excellent work on "Foods": "It is first necessary to insist upon the facts, that alcohol does not represent alcohols, and that alcohols cannot be regarded as a homogeneous class of fluids because they have one element in common. . . . For with one element among many it is irrational to assume that it should give identical, nay, even similar, characters to all, and more particularly when the experience of mankind in the use of that one element alone is almost absolutely *nil*.

"Alcohol alone is perhaps altogether out of the reach of the consumers of alcohols, since in the distillation of the spirits of wine, other products besides alcohol pass over; but admitting that spirits of wine is sufficiently pure for our argument, it is not used by alcohol drinkers.

"The forms in which alcohol is prepared as food are almost infinite, but they differ in flavor, strength, and composition, and each preparation might be reasonably expected to have its own special properties. Yet while all this is reasonable, and

is admitted when asserted, it was not adverted to by scientific men until my experiments on the action of alcohols over the respiratory functions, in 1856–59, and is not now so generally allowed as it ought to be. It is true that a few acute observers, as Hogarth, had drawn a distinction between the inhabitants of Gin Lane and Beer Street, by which they had made it appear that the state of health and the appearance of the two classes were different. It had also been known that a brandy drinker in rum-producing countries found an earlier grave than the rum-drinker. Rum had been selected as the spirit to be given to sailors, but the reason for it was perhaps not known. Was it cheaper or more readily obtainable than gin? No; for gin costs scarcely more than half the price of rum, and is of home manufacture, while rum must be imported. Was it that the flavor was preferred to that of gin? If so, the tastes of sailors differ from those of the spirit-drinkers of large towns. Was it that rum had been proved to produce effects different from gin? None of these had been proved, and yet the selection was a right one, and based upon sound principles. The effects of gin differ from those of rum, and rum is far the less injurious agent of the two." *

The chemical synonym for pure alcohol is *hydated oxide of ethyle*, the substance formed when ether and water are made to combine with each other, by the decomposing action of fermentation in any substance containing sugar and glucose. It is composed of carbon 52.66, hydrogen 12.9, and oxygen 34.44 per cent., and is expressed by the chemical formula, $C_4H_6O_2$. In its strongest distilled form it contains ten per cent. of water; and in the proportion of 49.5 volumes to 57.27 volumes of water, it is known as proof spirits. The specific gravity of proof spirit is 0.920, or twelve-thirteenths of an equal volume of distilled water at 62° F., and as the proportion of the spirit is increased, the specific gravity is lessened. For example, a spirit of the specific gravity of 0.838, is said to be 54 to 58 over proof, because it would require that number of volumes of water to be added to reduce it to the proof strength of 0.920. But while the commercial value of spirits is based on the proof

* Foods. By Edward Smith, M.D., LL.B., F.R.S., etc. American Edition, pp. 371, 372. D. Appleton & Co.

standard, the alcoholic strength of different spirits, as they are commonly found in the market, is exceedingly variable; as also the volatile oils and free acids—depending upon the nature of the substances from which they are derived. These differences, as already remarked, also exercise a modifying influence over their effects.

Alcoholic liquors as commonly used may be considered under three forms—*spirits*, *wine*, and *beer*.

1. Experiments have frequently been made to ascertain the local effects of spirits on the living tissues, by applying them to the transparent membrane of the frog's foot or bat's wing, and watching the effect under the microscope. The effect of pure alcohol thus applied is to cause the blood-globules and small blood-vessels to contract; to restrict and finally to arrest the movements of the blood-globules, and if the application is persisted in, the circulation is destroyed, the membrane becomes opaque and cold; and if the life of the animal is maintained, the part to which the application has been made sloughs. The effect of dilute alcohol, or of unadulterated alcoholic spirits, applied in the same manner as pure alcohol, however, is very different. The blood-globules enlarge, the membrane swells and becomes more vascular, minute blood-vessels are rendered more apparent in parts which were before opaque, the circulation is quickened, and the temperature is increased.

It thus appears that the effects of *undiluted* alcohol upon the blood and living tissues are the same as upon the dead—it absorbs and appropriates the water and coagulates the albumen of which they are composed; but *diluted* alcohol replenishes the blood-globules and tissues and quickens the circulation.

After an extended series of experiments with alcohols of various strength, the conclusions of Dr. Edward Smith (p. 386) are, that "with moderate or small doses of strong alcohols properly diluted and taken on an empty stomach, it is shown that the vital actions are generally increased with pure spirits of wine and rum, while they are lessened with brandy, and greatly lessened with gin. Whiskey varied more than the other alcohols, but generally its tendency was to lessen vital actions. But it is needful to repeat the observation, that there is much greater disturbing influence excited by these agents than by ordinary foods, and there was not that regular pro-

gression of increase or decrease usually observed with other agents. This extended even to the rate of pulsation and respiration. When rum was added to milk, as in a well-known compound, the effect on the respiratory functions was that of a true food, both in degree and persistency, but it was not greater than that of milk alone."

When alcoholic liquor is received into the stomach, after food especially, it is diluted by the fluids therein contained, and quickly absorbed. The heart's action is immediately quickened, its contractions take place both more rapidly and more forcibly; the blood is driven more frequently through the lungs, respiration is accelerated; and, as already shown, the volume of the blood being increased by the affinity of alcohol for water, and the small blood-vessels dilated, the blood obtains through the lungs and skin a more frequent exposure to the cooling effect of the atmosphere; hence the drunkard, or he who is for the time being under the influence of alcohol, perishes more quickly by exposure to cold than he who is not. But when the system is greatly exhausted by overwork, by exposure to extreme hardship and *short of oleaginous* food, in excessive low temperature, on the evidence of Dr. Kane, Lieutenant Greely, and others, a small quantity of spirits carefully served out in *spoonful* doses was invaluable. This is the experience of many others in similar emergencies; but as a reliance, or in continued exertion, it does harm by consecutive depression, and by lessening the bodily temperature.

Under the habitual use of alcohol the soft and vascular tissues of the body are the first to suffer. From the stomach, it is quickly conveyed to the liver, and this organ receives its full force. Its blood-vessels are distended, and by a continuation of the influence by frequent repetition of the potations, congestion of the liver is an early consequence. Inflammation supervenes, and this is shortly followed by fatty degeneration, and that form of contraction and hardening, which from its appearance is known as drunkards' or "hob-nail" liver. Dropsy is one of its most common symptoms, and this it is of which drunkards are more frequently said to die.

The brain, too, from its extreme vascularity and softness of tissue, is prone to suffer from alcohol in the blood. Indeed the brain and liver, the most vascular organs in the human

body, seem to be specially capable of holding alcohol and storing it up, as it were, insomuch that of persons or animals who have died soon after taking large quantities, these organs have a strong odor of the spirit, and it can be recovered from them by the process of distillation.

2. *Wines* greatly differ from spirits in that they contain a much smaller proportion of alcohol, and this in combination with variable amounts of extractive matter, sugar, malic and tartaric acids, and volatile oils—to which they owe their aroma. Naturally, wines which are the direct product from the fermentation of grape-juice rarely contain more than one-fifth of their bulk, or about 20 per cent. of alcohol; and frequently less than half of this amount. Those that contain more have been "doctored," that is, have had alcohol added to them.

The variable amounts of extractive matter, sugar, acids, and aromatic oils, pertain to different kinds or qualities of wines, and the kind of grapes used in their production.

In general, wines are characterized as being: natural or light, fortified or strong (those which have had alcohol added to them), red, white, sweet, fruity, dry or thoroughly fermented (not acid), full-bodied, thin, acidulous, astringent, and sparkling. And their quality depends upon the care taken in their production, and the length of time which has elapsed since they were made; for wines, as spirits, in general improve with age.

"A good wine promotes the appetite, exhilarates the spirits, and increases the bodily vigor. It should have a body or substance (which is different from alcoholic strength), and give rise to a sense of satisfaction instead of leaving a craving, empty, or hungry feeling, such as is produced by a thin and sour drink."*

The miscellaneous fruit-juices—from blackberries, currants, raspberries, etc.—fermented and called "wines," when not "doctored," are pleasant and for the most part wholesome drinks; but they will not compare in choiceness of flavor or purity with true wines.

3. *Beer* in its various forms, as lager, ale, porter, etc., consists of malt flavored with hops. It contains a minimum

* Food and Dietetics, Physiologically and Therapeutically Considered, by F. W. Pavy, M.D., F.R.S., etc., p. 259.

amount of alcohol—from one to nine per cent. by volume—and a large proportion of water holding in solution sugar, dextrine, nitrogenous matter, aromatic, bitter, and coloring principles, saline matters, and variable proportions of carbonic and acetic acids.

"Beer is a refreshing, exhilarating, nutritive, and, when taken to excess, an intoxicating beverage. Its nutritive properties are due to the extractive matter which it contains, and observation sufficiently testifies that beer which is highly charged with extract exerts a decidedly fattening influence.

"Its bitter principle renders it a stomachic tonic. A light beer, well flavored with the hop, is calculated to promote digestion, and may be looked upon as constituting one of the most wholesome of the alcoholic class of beverages.

"It is not all, however, who can drink beer without experiencing inconvenience. In the case of persons with bilious temperament, also with dyspeptics, and sometimes others, it is apt to excite headache, heaviness, and other sensations which fall under the popular designation of 'biliousness.'

"The stronger beers, taken continually in excess, induce a full and plethoric state, and are liable, particularly if conjoined with sedentary habits, to result in the accumulation of defective oxidized products, as uric acid, etc., in the system, and so lead to the development of gout." *

Cider and Perry, produced from the fermented juice of apples and pears, ordinarily contain as much alcohol as the strongest beers—from five to ten per cent.—They agree well with some people. But their proneness to acetous fermentation renders it necessary that they should be taken with caution. When new they are apt to cause diarrhœa; and when old, sour, and strong with alcohol, they are dyspeptic and "heady."

The common result of the excessive use of malt liquors is *plethora.* The first effects manifest in plethora or excessive nutrition display an apparent exuberance of health; hence the mistake that the most perfect health is consistent with their liberal use.

When the supply of nutritive material is habitually abun-

* Pavy, loc. cit.

dant, and the functions of the system are stimulated, the usual effect is increase of bulk, especially if the habits of exercise are not such as to create an amount of excretion proportionate to the inordinate supply of nutritive material.

If, however, the excess be only slight or casual, with a proportionate degree of physical exertion, the self-adjusting powers of nature may be equal to the irregularity, and prevent the transition of healthy into diseased action. But if the excess be great or habitual, the organic functions are overtaxed, and their conservative powers necessarily languish. This condition is succeeded by such irregularities as display the worst effects of the beverage, by the production of incurable diseases, which have had their foundation in apparent "perfect health."

It is obvious, therefore, that the exuberance of health evinced by the florid countenance and fatness of persons addicted to the excessive use of fermented liquors, are the suspicious evidences of a constitution taxed to the very highest degree of forbearance, which must, in course of time, become relaxed, and sink even below the normal standard of resistance. In this vitiated state of the system, constitutional predispositions to disease, that might otherwise have lain dormant, are frequently roused into speedy fatality.

That there are some constitutions which appear to be unaffected by the excessive use of alcoholic liquors is no less true than that of any other habit *tolerated* by the natural powers of endurance. But such habits only serve to demonstrate the capabilities of the human constitution, and are in no event admissible evidence of natural adaptation. For every one such person, there are thousands who suffer ill consequences.

THE DANGER LIMIT.

According to the late Dr. Edmund Parkes, who had extensive opportunities for observing the effects of alcoholic beverages on large bodies of men in the British army, the maximum amount of alcohol that may be taken daily by a man in good health without perceptible injury is *one and a half ounces.*

How much of any alcoholic beverage may be taken not to contain more than an ounce and a half of pure alcohol may be estimated by the following table of the

ALCOHOLIC STRENGTH OF DIFFERENT BEVERAGES:

	Per cent.
Brandy	50 to 60
Gin	50 to 60
Whiskey	50 to 60
Rum	60 to 70
Port wine:	
Strongest	36
Ordinary	22 to 26
Weakest	16.5
Madeira	16 to 22
Sherry:	
Strongest	25
Weakest	16
Burgundy	10 to 14
Sauterne	14
Hock	9 to 12
Champagne	5 to 13
Claret:	
Strongest Bordeaux	17
Mean	15
Vin ordinaire	8 to 9
Cider	5 to 10
Perry, average	7.26
Ale:	
Scotch	6.22
London, average	6.22
Burton	9
Ordinary	3 to 5
Brown Stout	6.80
"Malt Extract"	5 to 8.5
London Porter	4 to 5
London Small Beer	1.28

A practical application of this table may be made by the following extract from a little work on "Alcohol: Its Use and Abuse," by Dr. W. S. Greenfield:

"*One ounce* of alcohol is contained in 4 or 5 ounces of sherry or port; 6 to 10 ounces of claret or hock, and 12 to 20 ounces of ale or stout.

"The varying size of wine-glasses renders any certain statement as to the number of glasses which make up this amount impossible; but two glasses of port or sherry, or two or three glasses of claret, represent it pretty nearly. Half a pint of Burton ale, or a pint of ordinary ale, would nearly contain it. Some of the lighter ales and common porter, contain much less."

Hence for *one ounce and a half* of alcohol, may be reckoned three or four glasses of port or sherry; three to five of claret; two glasses of Burton ale; one and a half to two pints of common ale, and one to two quarts of lager beer. But it should be borne in mind that this is the outside limit, and represents the quantity which just fails to produce any obvious diminution of work in healthy men; whether it does not cause some deterioration of the organs is another question.

All reliable statistics of mortality show that total abstainers from alcoholic liquors, as a body, live longer than those who indulge in them. But this does not controvert the equally general truth, that among those who indulge in them to moderate extent, there are many feeble persons whose health is promoted, and whose lives are prolonged by their use. In a sanitary point of view, however, all things considered, there is no room for question that the general practice of total abstinence from all alcoholic liquors except as medicines, would greatly promote the health and happiness of mankind everywhere.

NARCOTICS.

Alcohol in sufficient quantities is scarcely less typical of the substances known as narcotics, than it is as a stimulant in smaller quantities.

On *men*, as already shown, in portions not exceeding one ounce and a half in twenty-four hours, according to the best authorities, no specially deleterious effects have been observed—no narcotic properties have been perceived. On women, who have more nervous susceptibility than men, and on children, more than either, there is danger of narcotic effects from smaller amount.

And here, it may be remarked, in regard to children, they are peculiarly susceptible to the influence of stimulants and narcotics. A familiar rule with physicians in the administration of medicines to children is:—in proportion of the age to the age increased by twelve.

For example, a dose of rhubarb for an adult is twelve grains. Required—the dose for a child, four years old: $4 : 4+12 \div 4 :: 4 : \frac{1}{4}$ of a dose for an adult, 3 grains.

While this rule will hold for most medicines, it is well known to be in excess for stimulants and narcotics. This is doubtless due to the peculiar effects of alcohol in accelerating the circulation of the blood, and dilating the blood-vessels. These effects upon the liver, have already been explained. To a still greater degree, they apply to the brain. Soft, and almost pultaceous, surpassing every other part of the body in the delicacy of its structure; environed by exceedingly vascular membranes and an unyielding bony case; penetrated through-

out with blood-vessels of extreme tenuity, which, even under ordinary circumstances, receive one-fifth of the whole volume of blood in the body, it is surely no wonder that when these blood-vessels are subjected to the pressure of an increased supply of blood, and their thin walls put upon the stretch, that the subtle fluid therein contained should deeply impress this most delicate, most sensitive and *all* important organ.

Exhilaration and stimulation to increased effort in all the bodily functions, are stepping-stones—and the stepping-off stones—from the stimulating effects of alcohol, in the order of progress to narcotism; it means a brain full of blood.

Intoxication, is a semi-narcotic condition. The brain is partially paralyzed, and sufficiently oppressed to be thrown off its balance; its influence to maintain a co-ordination of the organs is impaired or lost, the gait is unsteady, the tongue thick; the mind beclouded and uncertain, is lost to its sense of right and justice; virtue and vice are placed on the same level: —the threshold is crossed, the man is lost, and a fiend found!

Would that this were only a fancy sketch. Alas, few there are who know not its truth.

The victim of intemperance commonly suffers physical deterioration *pari passu* with his indulgence; and by persistence, his physical structure undergoes changes which result in the perpetuation of the diseases of fathers upon their children to the "third and fourth generations," or more, if measures are neglected for their restraint. That the children of intemperate parents are particularly liable to idiocy and insanity, or at best to feeble intellects and frail bodies, is unfortunately, one of those painful truths, so universally recognized, as to need no special citations. All such results excite pitiful emotions for the subjects; but it is too often the case that commiseration is divided between the unfortunate result and the guilty perpetrator.

He who voluntarily puts himself in the condition to debase his race, to commit murder, to wreck a train of cars, to sink a ship or to burn a city, is an enemy to mankind and dangerous to human society. He should be restrained of his freedom.

Indulgence in the use of opium, hashish, cocoa-leaves, and the like, produce similar effects on the body and mind as alcohol. Their action in small doses, or when first taken, is at first stim-

ulating, and subsequently narcotic; and this last, or secondary effect, is frequently characterized by a state of frenzy bounded only by the opportunity of the individual to commit any degree of crime—as if under the influence of alcohol.

Drunkenness, except in exceedingly rare instances, is a voluntary vice, and individuals who are guilty of it, should be impressed with a sense of *their own wickedness and debasement.* They should not be excused on the ground that they have been tempted above measure, and that persons who sell stimulants are more guilty than they who use them to excess. Such excuses and those who justify and advocate them, promote intemperance and its degrading effects, by encouraging the debasing propensity of wicked persons to hold some one else responsible for their own sins. It is no more reasonable to advocate that those who sell stimulants are the cause of intemperance, than it would be to advocate that those who keep any other kind of goods for sale, encourage thievery. Indeed, it would not be difficult to trace a parallel of thievery and drunkenness, except in their final goals. At the outset, they both commonly begin in a small way, and proceed with increasing appetites and gratifications, until finally one brings up—where both should—in the penitentiary; and the other in the almshouse, or, it may be, if his friends are able to afford it, and are persuaded that his vice was all the fault of other people, in some luxurious "home."

Knowledge of the excessive use of stimulants, in view of its extent, may safely be assumed of every intelligent person of grammar-school age in the United States, whether he has received instruction in physiology or not; and getting drunk should therefore be justly regarded as a deliberate act in the face of common-sense—the wilful placing of one's self in the condition to commit a crime or debase his race. And if every person who gets drunk, and thereby places himself in a condition more or less dangerous to society, were made liable to arrest and punishment, authors and publishers of physiologies for the public schools would not, as they now do, lack the courage to publish the whole truth in regard to the effects of stimulants and narcotics, and the rising generation would be in far less danger than they now are under the pressure of partial instruction.

A. N. BELL.

DRAINAGE FOR HEALTH.*

By Professor R. C. Kedzie.

THERE is pith and point in the common expression *our mother earth.* Sprung from the dust, we live upon her bosom and draw our vital supplies from her ample stores, and when "life's fitful fever" has burned itself out, our ashes drift back to their original source. We may as well humbly accept this fact that, as regards our physical existence, we are of the earth, earthy, and that we shall never free ourselves from these fetters of clay until this mortal shall put on immortality.

To turn our thoughts for a time to the physical conditions of life is no evidence of low desire and grovelling instincts, but is rather an exhibition of that wise forethought which has received the highest sanction. "A prudent man foreseeth the evil and hideth himself, but the simple pass on and are punished." Life is the gift of God, but continuance of life is conditioned upon and limited by its physical surroundings. If to live is noble, then the physical conditions of living cannot be ignoble.

It is not merely in times of flood and shipwreck that our confidence in the solid land is brought out. It is said that no form of danger begets such overwhelming and universal terror in man and beast as the earthquake, where the very *ground* of our security becomes a source of peril. We tremble before the thunderbolt and the tornado, we turn pale under the withering wings of the pestilence, but the soul dissolves in terror with the heaving throb of the earthquake.

But I do not propose to discuss these unusual conditions and uncommon dangers, but turn your attention to some of the conditions of common life. *Common life*—a tame and uneventful theme. The uncommon life of the great, of heroes and statesmen, generals and admirals, who scourge the earth

* Read before the Michigan Tile and Drainage Association, in the city of Adrian, March 12, 1884.

and vex the sea; the rich, the powerful and mighty ones of earth, who live the uncommon life—this has a fascination for us all, in comparison with which common life seems mean and dull, just as our eyes light up as we gaze upon the gorgeous hues of the rainbow, forgetting the common light of day. But as it takes all the colors of the rainbow to make the common light of day, so all heroisms and excellence go to make up common life. In its entirety and intrinsic value common life is more valuable than all chivalry, romance, oratory, and poetry, just as the ocean is grander and weightier than all the clouds which spring from its bosom only to float in lofty disdain through the fields of air. All honor to common life because it is common, and a reverent study of the conditions of its betterment.

THE VALUE OF HEALTH.

Next to life the most precious possession is health, the harmonious co-ordination of all internal and external physical forces to secure the well-being of the individual. The conditions of health have been laid down as pure air, pure water, and pure food. These three "P's" are three prime factors of health, but are not all the conditions. Atmospheric temperature and moisture, which are controlling forces in climate, have also intimate relations to health. The fact that the human body, amid wildly conflicting changes of temperature, must still maintain a temperature of 98° F.; that to fall much below or rise much above that temperature causes disease, and, if continued for many hours, causes death; and the further fact that many processes of secretion and excretion, of assimilation and consumption, are delicately counterbalanced against each other to obviate the effect of marked changes of temperature, are indicators of the controlling influence of temperature over health and even life. One writer has tersely said: "Heat is life, cold is death."

THE SOIL AND HEALTH.

Since the soil must affect the composition of the air overlying it, has a profound influence upon the water contained within it, and has a marked control over the local temperature, it becomes evident that the soil itself and the physical condition of the soil must have a marked influence on the health of its

inhabitants. Very obviously, the soil is the physical basis of life. I pass by all questions of composition, texture, color, specific heat, and conductive power of soils, and confine my attention to the relation of soil-water to health.

SURFACE DRAINAGE.

The drainage of swamps and marshes and the removal of all stagnant surface-water have been so beneficial to the health of the community that no one in this age questions the benefit. In a State where one-ninth of the surface is indicated upon the original surveys as swamp, the benefit to the general health must be obvious. Within my own memory the malarial diseases of this State have been reduced one-half, and the most potent factor of this reduction is drainage of swamps. No law ever placed upon our statute books has been productive of more good and less evil than the law providing for compulsory drainage, where each land-owner was compelled to bear his just part of the burden, and no churl could block the draining of a whole neighborhood because he chanced to control the outlet. This law has paid the State ten-fold the cost in reclaiming a large area of once worthless land, and it has paid a hundred-fold in promoting the public health.

UNDERDRAINAGE.

Surface drainage needs no advocate to-day, and I turn my attention to a form of drainage equally necessary, but the need for which is not so obvious. I refer to the underdraining of soils whose surface appears reasonably dry, but whose deeper recesses are full of stagnant water. Such water is never to be mistaken for soil moisture or water held in the soil by capillary action, but is the free water of soil, which will flow under the action of gravity, and has been named *ground-water* by the Germans.

This ground-water diminishes in a marked degree the agricultural capabilities of the soil, lowering the temperature, preventing soil oxidation, arresting the elaboration of plant food, and preventing the free spreading of the roots in the soil; because the roots of most cultivated plants will die in stagnant water. I do not propose, however, to discuss the agricultural value of drainage.

GROUND-WATER AND HEALTH.

The influence of ground-water on health is equal in importance to its influence on crops. No matter how fertile the soil if the farmer, by reason of sickness, is unable to sow, harvest, and garner the golden grain. I call your attention in particular to this influence of ground-water present in the soil in consequence of imperfect drainage, because people are only beginning to realize how profound is the influence of ground-water on the public health. This influence is exerted directly in three ways: *By making the soil and the air above it cold; by making both damp;* and by *generating malaria.* Indirectly the ground-water is the *predisposing cause of a large number of diseases.* Let us look at this subject in the meteorological conditions we find at the State Agricultural College.

ANNUAL RAINFALL.

The following table gives the mean monthly rainfall at the Agricultural College as determined by twenty-one years' observations, from 1863 to 1884:

Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.72	2.05	2.49	2.54	3.19	4.34	3.94	2.54	2.77	2.46	2.18	1.91

YEAR—32.13.

This is the average rainfall, some years more than this and some years less. The rain-water will be disposed of in three ways: 1. Used up by growing plants and evaporated by the leaves and stems. 2. Flowing away either over the surface or by subterranean channels. 3. Evaporated. When we speak of so many inches of rainfall we seem to be dealing with small quantities of water, but the gross amount is really large; thus, one inch of rainfall means 112 tons of water to the acre, and the annual rainfall on each acre at the College is 3,600 tons.

LOSS OF HEAT.

The mean rainfall for six months from April to end of September is 19⅛ inches. Suppose an acre is planted to corn, producing 20 tons, and assuming Knop's estimate that it will

evaporate from its leaves and stems during the period of growth 36 times this weight, then 720 tons of water—say 6½ inches of rainfall—will be used up by the growing crop, leaving 13 inches to be disposed of in the six months by flowage and evaporation. Suppose that by flowing over the surface and by evaporation, which will take place from the surface of any moist soil, 6 inches of the semi-annual rainfall is made way with, and that the remaining 7 inches would flow away by subterranean channels if such were provided. In their absence, this mass of water can be disposed of only by an increase of the natural evaporation. Evaporation is a powerful cooling process. To evaporate 1 pound of water will consume an amount of heat sufficient to raise the temperature of 5½ pounds of water from freezing point to boiling heat. By evaporating such a mass of water the temperature of the soil is lowered to a surprising degree, with a corresponding loss of active force for the use of vegetable life. If we attempt to make good this loss of heat by unnecessary evaporation, and to restore the normal temperature of such a soil, it would require all the heat caused by burning 65 tons of coal for each acre. No wonder the farmer calls such a soil *cold.* Any means by which we can draw off this water without evaporating it will be a large addition to the available temperature of the soil during the growing season. Every tile that discharges 5 tons of water a day for six months saves an amount of heat equivalent to 75 tons of coal.

TILE-HEATING.

Let me vary the illustration, because the loss of heat by evaporation and the saving by drainage is so important that it cannot be placed in too clear a light. Suppose that a tile drain discharges constantly for six months a stream of water whose cross-section is one square inch and velocity 2½ miles an hour, how much coal will be required to evaporate the mass of water thus discharged? More than 1,000 tons of coal! Suppose the drain discharges only six weeks of this period and is dry the rest of the time, this six weeks' drainage will still save the heat equivalent to 250 tons of coal. It is a physical necessity that a water-soaked soil should be a cold soil during all our so-called hot season. The evils springing from this cause are more manifest in spring and early summer, but it is at this

period that tile drains are most active. It is at this season, also, that animal and vegetable life alike demand warmth as they shake off the shackles of enforced hibernation.

CHILLED AIR.

But the evaporation of so much water producing cold renders the air over such a soil *damp and chilly*. This result is a physical necessity. This damp and chilly atmosphere has a more serious influence than the simple feeling of discomfort. It has a most depressing influence on the human system, lowering its tone, enfeebling the vital powers, and acting as the predisposing cause of a long list of diseases, some of them the most destructive and incurable known to medicine. The depressing influence of the dampness and chilliness of water-soaked soil is not to be compared to the effect of an occasional wetting, as when we are caught in a shower. The chilly dampness of the undrained soil is persistent and unremitting, dragging us down with its cold fingers at all hours of "noon of day and noon of night," as if we labored and rested, waked and slept in a perpetual drizzle of a cold rain. It may seem a small force at first, but its persistent, untiring, and relentless pull tells upon the strongest at last, like the invisible fingers of gravity, which finally drags down all to a common level, whether towering oak or cloud-piercing mountain. This depressing influence is not developed suddenly and distinctly; an hour, a day, a month may show no marked deterioration, else men would flee from such places as from a plague-spot; but silently and secretly the sapping and mining go on till the explosion comes in sickness, suffering, and the sleep that is eternal.

Once more, a water-soaked soil is the fruitful source of *malaria*, giving rise to that devil, *ague*, and "his name is legion."

SOIL-BREATH.

There are certain other conditions secured by drainage of the soil which are essential to the health of the inhabitants, and one of these is aëration of the soil, or the passage of air through the pores of the soil. The air is entirely excluded from water-soaked soil; the entrance of air is prevented and all interchange between the air and soil—all *soil-breath*—is

prevented. Have you ever thought how *everything breathes—animate and inanimate alike?* You inspire and expire air continuously, and thus keep yourself in good condition, and so does your coat and jacket! The air penetrates every fibre of your wardrobe, passing in and out, and carrying out something it did not carry in. If your clothing was impermeable to air you could not tolerate it for an hour. The invisible waves of air wash and purify you every hour.

Let me illustrate this: I cover the bowl of this tobacco-pipe with the skirt of my coat, and bring the stem of the pipe before the candle-flame: you see I can easily blow air through several thicknesses of cloth and sway the flame by the current of air. I do the same thing with buckskin, a felt hat, leather, and everything we wear except India-rubber.

If you suppose your clothes do not breathe, place them in an air-tight box and strangle them for a few months, when the musty smell will convince you that your clothes must breathe to remain sweet and wholesome. Even the solid bodies, such as wood and stone, are still-washed and infiltrated with air. Here is a stick of red oak a foot long, and you see I can readily blow air through it. Here is a roll of mortar, such as masons use in plastering walls, and you see I can, with the slightest effort, blow air through four inches of dry plaster.

Not only can the air pass through these bodies, but it does pass under natural conditions, and *plastered walls breathe.* In plastered rooms where the walls have been left undisturbed for some time, you see the position of every beam and joist, and even the lath, by the lighter color of the wall. The part of the wall occupied by the plaster only is more permeable by air, which, in passing through leaves the dust behind, forming a brown streak. Breathing the dusty air for months, the wall has its nostrils filled with dust, and very evidently the old house has a dirty nose!

The soil also breathes. Under proper and sanitary conditions the air passes in and out of the soil with every motion of wind. You will be surprised to see how readily air may be made to pass through soil. Here is a jar fourteen inches high filled with compact, dry soil, the top closed with a doubly perforated cork; through one hole a glass tube passes to the bottom of the jar, but terminates above in a horizontal jet;

through the other hole a tube passes to the space above the soil. On blowing into this tube gently you see that the air passes down through fourteen inches of soil, because it escapes freely at the horizontal jet of the other tube, as is shown by blowing the candle-flame before it. Here is another tube, five feet long and mounted in the same way, and you see I can force air through the dry sand and sway the candle-flame by the escaping air.

WATER STOPS SOIL-BREATH.

But all this is changed in the presence of water in these materials. If the walls of the house are wet, the passage of air is prevented. I wet this half-inch of plaster and you see I cannot force the air through it. In the same way, if the soil is drenched with water the passage of air is prevented. I have here a bottle filled with soil saturated with water, and you see how the passage of air is prevented—that the air will pass through fourteen inches of dry soil easier than through four inches of wet soil. Indeed, the air will not pass at all through this thin stratum of wet soil, but will readily pass through this thick stratum of dry soil. You thus see that *a drenched soil is a drowned soil;* that all the conservative influences secured by the interaction of soil and air are cut short by the presence of ground-water. You see that such a soil must be unhealthy aside from the cold and damp quality of the air which overlies it, though these are themselves prime factors of disease.

"A wet soil is proverbially unhealthy, and marshy and waterlogged lands have long been recognized the world over as a cause of paroxysmal fevers" (Buck's Hygiene, vol. i., p. 412).

The Sanitary Report for England, 1852, gives the following conclusions in respect to the influence of soil dampness:

1. Excess of moisture, even on lands not evidently wet, is a cause of fogs and damps.

2. Dampness serves as a medium of conveyance for any decomposing matter that may be evolved, and adds to the injurious effect of such matter in the air; in other words, the excess of moisture may be said to increase or aggravate excess of impurities in the atmosphere.

3. The evaporation of the surplus moisture lowers temperature, produces chills, and creates or aggravates the sudden

and injurious changes of temperature by which health is injured.

Dr. De Chaumont, in his lectures on State Medicine (1875), says: "It is generally admitted that a persistently low ground-water, say fifteen feet or more down, is healthy; that a persistently high ground-water, less than five feet from the surface, is unhealthy; and that a fluctuating level, especially if the changes are sudden and violent, is very unhealthy."

Says Dr. James Clark: "Humid, confined situations, subject to great alteration of temperature between day and night, are the most dangerous. Of all the physical qualities of the air, humidity is the most injurious to human life" (Buck, i., p. 444).

An investigation into the causes of an outbreak of diphtheria in New York in 1872 brought out the fact that many of the old water-courses and natural springs had been filled in years before, without making any provision for draining the soil, and the disease seemed to be especially prevalent along the lines of these old water-courses.

In an outbreak of cholera in Dublin in 1866, Dr. Mapother says two-thirds of the deaths took place on or close to the old water-courses that had been converted into sewers or filled up with mud.

Catarrh and rheumatism are natural products of the chills and damps of an undrained soil. Diarrhœa, dysentery, and malarial fevers are very common and very severe in type in districts where ground-water abounds and the water-line approaches the surface.

GROUND-WATER AND CONSUMPTION.

Finally, extensive researches in England, Germany, and America have established the fact that undrained soils greatly promote consumption. This fell disease, the direct cause of one-seventh of the deaths in the world, finds its favorite haunt in the water-logged soil. This is no wild guess, thrown out to be the sensation of the hour, but it is sustained by a vast array of facts, and is a result independently reached by separate investigators in widely separated countries. However precarious may be the field crops on a water-soaked soil, the abundant house crop of consumptives may safely be counted upon.

The entailments of living on water-soaked and undrained soil are catarrh, ague, and rheumatism in the spring, diarrhœa, dysentery, and fever in the hot months, pleurisy, pneumonia, and diphtheria in the cold months, and consumption all the year round.

THE MARCH OF EVIL.

To the thoughtful mind one of the saddest sights is the endless succession of evil arising from preventable causes. In his recent address as Lord Rector of the Glasgow University, John Bright drew a striking picture of the endless procession, marching on in successive generations, of ignorant, impoverished, and embruted men, with their sad-eyed and hunger-pinched wives and children, caused and continued by the enormous taxes imposed to maintain the conditions and appliances of successful war in times of profound peace. In a less dramatic but no less true light we may draw the lineaments of physical evil, casting its long shadow down the corridors of time. We have histories of races and dynasties, their rise, progress, and decline, the causes which brought them into prominence, and the forces which brought them to their downfall. Why should not a soil have likewise a history of its own and take on a personality as truly as a race? Let us scan the features of such a farm and follow the history springing from its inherent qualities. The surface is somewhat level or gently undulating, the soil a tenacious clay, strong in the elements of enduring fertility if the physical conditions are properly adjusted. The natural drainage is very slight, except that much of the surface-water can run off by overflow, but the tenacious quality of the soil prevents all deep drainage; the deeper soil is water-soaked in spring and early summer, and at other times when heavy rains fall; gate and fence posts are heaved by the frost, winter wheat and clover are half uprooted by the same force. Work is late in the spring because the soil is cold and wet; crops are slow to start and slower to ripen. The farmer "has a hard row to hoe." A hopeful and cheerful spirit is conspicuously wanting because he has generally poor success with his crops, "bad luck," and because he has the continuous depression of poor health. The furrows seam his cheeks early, his shoulders stoop when he should stand erect in manhood's prime.

Indoors the wife soon fades, the bloom and laugh of happy girlhood give place to the chronic invalidism of motherhood. Children are born only to die, or linger on in joyless ill health. The family is finally blotted out, unless a surviving son may hand down this heirloom of sorrow to another generation, when the farm passes into other hands to repeat the same story. And thus we see, in hopeless succession, the generations of joyless owners pass before our eyes. The doctor, the undertaker, and the sheriff enter in succession to shift the stage scenery, but the same sad drama goes on with little variation.

If nature had only planted a gravel-bed under his whole farm, outcropping on some stream-side, so the cold waters might laugh and sing on their way to their home in the sea, thus warming up his soil to early fruitfulness and warming up his soul to the real joy that springs from hope and health, bringing light and laughter to the housewife by letting the tinkling spring-drop replace the scalding tear-drop, how changed the history of such a farm! Competence, and even abundance, come from the grateful returns of his well-conditioned soil, as the earth teems with her harvests. Health comes to crown the mercies of the year. His children rise up to call him blessed instead of beckoning him with their shadowy fingers to the spirit-land.

Is this all a figment of the imagination? Can you not tell of farms where many of these features can be traced in the water-soaked soil, but finally reclaimed and regenerated by thorough drainage?

SANITARY DRAINAGE.

Drainage on the large scale for sanitary purposes is almost unknown. All our knowledge on this subject is derived from drainage undertaken for agricultural purposes. But whatever the purpose for which drainage is undertaken, the benefit to the public health is always pronounced and unmistakable. In the drainage of large tracts of swamp land in Bureau County, Ill., Dr. Breed reports that 36,000 acres of swamp lands have been greatly improved or quite redeemed; 20,000 acres hitherto of little or no value have been converted into excellent pasture or meadow lands, while no inconsiderable portion has been rendered good tillage land. Thus, by these means, thou-

sands of acres, once nearly covered with water, swampy, grown up and covered with reeds, brakes, and coarse grass, interspersed with knolls covered with small trees and tanglewood, the haunts of water-fowls, reptiles, and muskrats, sending forth over the adjacent country a noisome and pestilential miasm, have become converted into dry land, rich pastures and meadows, where vast herds of cattle may be seen cropping the rich, luxuriant grasses. As a natural consequence, the health of the inhabitants has been improved at the same time (Buck, i., p. 422).

Governor Porter, of Indiana, in his address of welcome to the American Public Health Association, at Indianapolis, October, 1882, alluded to the benefits of sanitary drainage in the following words: "It gives me pleasure also to say that the practice of underdraining the soil has, in this State, been found so greatly to increase its productiveness that, in proportion to the area of the State, it is said that we have more underdrained soil than any of the States. Underdrainage has everywhere been followed by a great lessening of sickness, and intermittent fever, once so common, has become so rare that it is a good deal less prevalent than in some of the oldest of the States. Our laws relating to drainage have been recently much improved, and a disposition to relieve the soil in every portion of the State of all excess of moisture tending to lessen its productiveness and to bring on sickness, is everywhere evident."

DRAINAGE OF DWELLINGS.

The sanitary drainage of dwellings has received more attention than that of fields, but is still too much neglected. The sentimental rather than the sanitary idea of home has captured our thought. The paradisaic poetry and fiction, which attempt to describe the ideal beauties of home, which sing of "fuming rills, of gushing fountains with many a rill, of damp moss glistening with orient pearls, of blissful bowers, of thick-set covert, of inwoven shade, of umbrageous grottoes and caves of cool recess," will do well enough for the unreal world of the imagination, but will scarcely answer for the hard world of actual life. Mr. Adam, with a crick in his back or his left knee doubled up with rheumatism; Mrs. Eve, with an old

shawl over her head and a tear in her eye as she groans over the jumping toothache; and little Abel, as he trots around with a cold in the head and a nose that calls constantly for a handkerchief, are not poetic. They are pathetic rather than poetic. Dampness and shade, gushing springs and dripping moss, delightful smothering with flowers and twining plants, will do well enough to read about before a rousing fire with your feet in warm slippers, but they have their little drawbacks in actual contact. When sentimentalists spin off this delicious alliterative nonsense in behalf of wet and wooing, flowing and flowery, give them the curt sanitary admonition with a double meaning, *dry up!*

That healthy houses may be built upon very unpromising sites by first securing good drainage, is a matter of daily experience. A tract of land in the suburbs of Detroit was so wet that it was supposed to be nearly on a level with the Detroit River, though it was seventy feet above the river level. During wet seasons it served as a preserve for frogs and mosquitoes, and during the dry season the baked and cracked soil seemed to be gaping and yawning with ague chills. The soil was tenacious clay with occasional pockets of sand. It seemed an unpromising spot for human habitations. Sewers were sunk ten feet below the surface with laterals for cellars. The sewers served both as surface drains and subsoil drains. Twenty-eight houses have been put up since 1872, and there have been no cases of ague, dysentery, or fever; indeed, the locality has been rendered exceptionally healthy (State Board of Health, 1877, p. 56).

Examples of this kind might be quoted by the hour. But when houses are built upon retentive water-soaked soils and no means employed to take off the ground-water or ward off its effects, the harvest of woe is sure, though it may be slow to ripen.

Two brothers in Vermont, of strong and vigorous stock, and giving equal promise of a long and active life, married wives corresponding in promise of future activity. They both had chosen the healthiest of all callings—farming. One of the brothers built his house in an open and sunny spot, where the soil and subsoil were dry; shade trees and embowering plants had a hard time of it, but the cellar was dry enough for a

powder magazine; the house in all its parts was free from every trace of dampness and mould; there was a crisp and elastic feel in the air of the dwelling. The farmer and all his family had that vigorous elasticity that reminds one of the spring and strength of steel. Health and sprightly vigor is the rule, and sickness the rare exception. The farmer and his wife, though past threescore, have yet the look and vigor of middle life.

The other brother built his house in a beautiful shady nook, where the trees seemed to stretch their protecting arms in benediction over the modest home. Springs fed by the neighboring hills burst forth near his house and others by his barns; his yard was always green even in the dryest time, for the life-blood of the hills seemed to burst out all about him in springs and tiny rivulets. But the ground was always wet, the cellar never dry, the walls of the room often had a clammy feel, the clothes mildewed in the closets, and the bread moulded in the pantry. For a time their native vigor enabled them to bear up against these depressing influences; children were born of apparent vigor and promise, but these one by one sank into the arms of the dreamless twin brother of sleep under the touch of diphtheria, croup, and pneumonia. The mother went into a decline and died of consumption before her fiftieth birthday, and the father, tortured and crippled by rheumatism, childless and solitary in that beautiful home which elicits the praises of every passer-by, waits and hopes for the dawning of that day which shall give him back wife and children, an unbroken family and an eternal home.

"Look on this picture, then on that."

LACTOPEPTINE continues to hold its well-earned position as one of the very best remedies in the digestive disturbances so frequent in the hot season. In *cholera infantum*, especially, when combined with bismuth, it will be found one of our most trustworthy remedies.—*St. Louis Clinical Record.*

SANITARY COUNCIL OF MARYLAND.

THE Second Sanitary Council of Maryland, under the auspices of the State Board of Health, was held at the Blue Mountain House, Md., September 17–19. The meeting was called to order by ex-Governor John Lee Carroll. Owing to the absence of Professor R. McSherry, the President of State Board of Health, on account of sickness, the address of welcome he had prepared was read by Dr. C. W. Chancellor, Permanent Secretary of the Council. Professor McSherry began by stating that all who were present, irrespective of occupation, were present on a common ground for the common good. He then made reference to a few matters of prominent interest. If good food, pure air and pure water were in every community, he claimed that one-half of the diseases therein prevalent would disappear at once and forever. Good food implies not only the substantial elements which nature furnishes so abundantly, but also as supplementary to natural art, that is, the food must be well prepared and well served.

"It has been said that God sends us food, but the devil sends cooks. The ladies must come to the rescue, not necessarily to brown their own fair fingers over pots and kettles and ovens, but to such intelligent superintendence that all the family shall find at the table the daily bread light, and sweet, and wholesome, and all its accompaniments, baked, boiled, stewed or roast, no matter how few or how plain the dishes, so well cooked as to please the palate and not distress the stomach. The preservation of this organ in good condition is of prime importance in health and contentment. Pure air, such as we have here at Blue Mountain, is not easily obtained in cities or in malarious districts, or even in country houses with good surroundings, where ventilation is defective. Architects, engineers and plumbers must co-operative with the doctors in this matter."

Referring to the subject of infant mortality, Doctor McSherry attributed the majority of deaths during warm months

to foul air. He thought scientific sewerage could accomplish a good deal in correcting this scourge, but he did not think that it is proved yet that sewerage is the final and complete remedy.

"Malaria is subject to correction, and so far as country homes go, or any homes, it holds to reason that proper measures should be in daily use, especially during winter, with artificial warmth, to let fresh air in and foul air out of the house. This seems to be a truism not worth saying, but I have gone into hundreds of houses where such precaution is entirely ignored. By pure water we do not mean water chemically pure, but water free from noxious ingredients. Very many diseases are propagated by impure drinking water. Cholera, typhoid fever, intermittent fevers, intestinal worms, and numerous other affections, befall our race from polluted water. Boiling and filtering are good correctives of water in the house, but so far as practicable polluted water should never gain admittance.

"The rivers that supply cities should be watched with the most jealous care to save them from all kinds of filth—animal or vegetable—and in villages or about country homes it should be seen that there are no surface washings or underground channels conveying to the well or spring organic remains or other impurities from adjacent sources—as the barnyard, the privy, or pig-stye."

Dr. McSherry referred next to the ruinous method of education as now pursued. He said: "There is too much schoolroom crowding in every sense. The number of pupils is too great generally for the room occupied, but this crowding is certainly not worse than the cramming attempted with a multiplicity of studies. Every physician observes how much injury is done to children by the course pursued both to the mental and bodily faculties. If the design is to break down teachers and scholars, especially the growing girls, it is being duly accomplished; but if it is to invigorate mind and body, it is unquestionably a failure. The mind and the body are very closely allied, there being between them such correlation of forces that the solid invigoration of the one helps the other, and the impairment of the one damages the other. This is a subject very worthy of the consideration of the convention.

"The final matter to which I will refer is the devising of

some means by which a certain social canker may be kept from desolating American homes. The ostrich, it is said, hides his head that he may not see or be seen, when pursued by his enemies. But it does not save him. Neither will closing the eyes on the part of the community put any check to the progress of a monstrous evil which is threatening the very vitals of society. Legislation must be brought to bear, not to make all this world virtuous, but to keep moral lepers from contaminating virtuous families.. *Verbum sap.* The Board of Health is an executive body, and we invite you as counsellors and experts, to give it your opinions, your advice and information upon the various special and technical subjects bearing upon the great cause in which we are engaged."

ADDRESS OF GOVERNOR CARROLL.—Ex-Governor John Lee Carroll said that in accepting the very high honor of presiding over the council he had but one regret, and that was his inability to throw any light upon the important questions which were under consideration. He was present in obedience to that spirit which should grow strong among all classes of our citizens, that however important may be the duties we all owe to the body politic we can entertain no higher purpose than that of sustaining the proud and charitable efforts of those who are striving to improve the physical condition of the communities in which we live.

"The names of the great leaders of science who have worked out problems by which man is in a measure relieved of suffering, will live in history when the memory of heroes of other fields has passed away, and the whole world looks to-day with interest at the results of that study which seeks to confine pestilence within the narrowest limits and thus to break the force of the greatest evils which afflict mankind.

"No one can read without the keenest sympathy the progress of the cholera through the fairest portions of Italy, and while we stand in admiration at the sacrificing spirit of her noble King, who in the midst of this carnival of death is there in person to cheer the timid and to give comfort to the afflicted, one cannot but feel that the practical application of the rules of health would have averted this great sorrow and turned into other channels the most fatal epidemic of modern times.

"Who can doubt that Paris to-day would have been in mourning for the loss of thousands of her people had it not been for the discipline of science and the stern efforts of her boards of health, which make the methods of preservation even more important than the questions of cure? Now if this be so, what a solemn warning there is to us in the truth of the assertion, and how surely may we become the victims of disease if we neglect the system by which alone it may be averted. The labors of our State Board of Health, although of comparatively recent origin, have not been without fruit. The energy of its permanent Secretary in visiting infected districts and in seeking out the hidden causes of disease has brought confidence and relief to stricken portions of the State, and has often inspired the local authorities with the determination to remove the flagrant causes of suffering.

"There can be no doubt as to the value of constant inspection and supervision, and this can only be brought about by the public support of an institution fostered earnestly by the State.

"It is to encourage this sentiment that we have met here to-night, and the production of the important papers which will be presented to the world cannot fail to strengthen the cause and to satisfy the public as to any expenditure which is made in its behalf."

The first paper was read by Dr. Jackson Piper, of Towson, Md. It was entitled "DIPHTHERIA—ITS LOCAL AND SANITARY TREATMENT." *Dr. Piper* began by referring to the indifference which legislators and others manifested towards vital sanitary matters. He argued the need of diffusing general knowledge on sanitary subjects, so that the public may know and force its executive servants to measure up to the requirements of every-day life. Dr. Piper cited cases from his own practice to prove the spontaneous origin of diphtheria in filth.

"Such cases," he said, "admonish us to thoroughly scrutinize our surroundings, to keep away from diphtheritic patients and their attendants, to disinfect thoroughly the clothes and excreta, and instant removal of the well from the infected house, or if the latter is impossible, outdoor exercise, and sleeping-rooms with open windows the most distant. A mild case can cause a severe one, and the disease can be car-

ried by the healthy. Perfect isolation for the sick and their nurses, and cleanliness in the latter as to their hands, hair and clothes. The temperature of the well to be taken once a day; and in this connection all families should keep self-registering thermometers, as life-saving instruments, giving timely warning of danger, and proving a valuable aid of information to the physician; unnecessary petting of the patients, kissing them, or talking over diphtheritic wounds forbidden; attendants to insert cotton in their nostrils, to be changed frequently, to prevent ingress of poisonous material; air of room cool, and bedding and patient's clothes to be kept fresh, and after convalescence a warm bath with carbolic soap and fresh clothes in another room; private funerals, and speedily over; to fumigate the rooms and their contents by burning sulphur, and to burn the bedding and all useless articles. The stamping-out process is full of trouble and expense, but it is the best and safest. To whitewash or repair walls, to wash and revarnish the furniture and woodwork, and to scour the floors, using strong carbolic soap.

"Disinfection by carbolic acid was shown to be impracticable from experiments made by Dr. George U. Sternberg, United States Army, owing to the very large quantities required and the expense in destroying fever germs. Brimstone, copperas and white vitriol were cheaper, more efficacious and more easily applied."

The prevention of diphtheria by the administration of drugs was considered. Chlorate of potash, sulpho-carbolate of soda and salicylic acid had been used successfully not only in diphtheria, but in scarlet fever and measles. Referring to the question of treatment Dr. Piper said:

"Some four years ago, after much discouragement, which was further increased by a letter from the late Dr. Riggin Buckler coinciding with the writer, he hailed with a gleam of hope Oertel's local method as detailed in "Ziemssen's Cyclopædia." This consists in the constant and vigorous use of steam medicated with chlorate of potass. (10 to 15 grains to the ounce of water) or table salt, and applied *directly* to the diseased surfaces by inhalation, hourly or half-hourly, according to the gravity of the case, each sitting to occupy fifteen to twenty minutes—the patient to sleep only three or four hours

for the first twenty-four and forty-eight hours, and as the membrane commences to be thrown off six to eight hours' sleep may be allowed. The inhalations to be practised afterwards every two, four or five hours until the throat is perfectly clear. This treatment to alternate when improvement begins, but not too soon, by spraying with lactic acid, twenty drops to the ounce of hot water, or by gargling or mopping the throat with dilute chlorine water or carbolic acid or permanganate of potass., 2½ grains to the ounce. The instrument used is a chafing dish with deep sides, or a quart tin can, a piece of canvas five or six feet long, some pasteboard, a tripod and a spirit lamp with three burners. These are readily obtained and easily arranged. The canvas tapers off in a mouth-piece, into which is inserted a tube of pasteboard, which can be shortened or lengthened as the steam is too cool or too hot, and the heat may be further regulated by blowing out a burner or two, taking care that the steam is as hot and full in volume as the patient can *possibly bear*. By pressing the mouthpiece close to the mouth, the little patient's face will not be irritated by the steam. I have not lost a patient (some 22 cases) since using this method, and I lost patient after patient on the old methods. Several of the recoveries were severe cases of the catarrhal form; one desperate case of the croupous, with a severe relapse; one laryngeal, with complete extinction of the voice and great oppression of breathing, and one septicæmic. The old plan of using steam, as described by Dr. Jacobi and Dr. Aitken, and others, is stupid, inefficient, and dangerously depressing. A room kept constantly moist with vapor, a tent over the crib saturated with steam, is steaming the patient and not the disease, and is a total misapplication of the principle. My patients recovered in a remarkably short time, five days being the longest period. The old plan runs them a week or more, and finally carries them off by blood-poisoning. Many die within three days. Oertel says that the use of astringents, disinfectants and caustics cannot penetrate, dissolve or destroy the membrane without increasing the disease by the irritation they cause, and that steam, by producing suppuration, detaches the membrane and causes its expulsion. This is how nature brings about a cure.

"The same principle is applied by poulticing in various

diseases, particularly in the removal of crusts in milk crust, rupia, ecthyma, etc., so that astringent and alterative lotions may touch the diseased surfaces. The steam treatment is full of trouble, and is very irksome and disagreeable to the patients, but kindness, firmness and perseverance will conquer. It is the life or death of those most dear to us that we are fighting for, with not a moment to spare. I believe in the germ theory, and that the constitution only becomes affected after the bacteria act as local irritants, and that the poison of these parasites being absorbed, blood-poisoning is the result. The constitutional treatment, therefore, is equally as important as the local, which consists in the free use of brandy, beef tea and other soups, and in the use of quinine, muriated tincture of iron: chlorate of potash, and special indications are to be met by their appropriate remedies."

The next paper was read by *Dr. George H. Rohé*, of this city, on "DANGERS IN FOOD." Dr. Rohé discussed at some length the various ways in which foods were made unwholesome, and how this could be prevented.

The subject of milk was discussed as follows:

"In my opinion the milk of swill or slop-fed cows may be as rich and wholesome as any other milk, provided the cows are housed in clean, dry, and well-ventilated stables, and often turned out to pasture. The danger does not lie in the food of the animal, but in the character of the animal's surroundings. If our city or suburban dairymen could be made to understand the importance of this, the outcry against 'swill milk' would soon lose its effect. As things are at present, it is based upon a real danger. The milk of cows suffering from the so-called cattle plague, contagious pleuro-pneumonia or foot-and-mouth disease is also said to produce illness when drunk. The symptoms are generally referred to the gastro-intestinal tract. There seems no room to doubt that the flesh of animals suffering at the time of death with splenic fever, foot-and-mouth disease, symptomatic anthrax, and contagious pleuro-pneumonia will, if consumed, produce serious or fatal diseases in the consumer. It is well known that the use of meat containing animal parasites, such as trichina spiralis, echinococcus or cysticercus will often result in very grave affections in persons eating such meat, especially if not properly

cooked. It has been shown beyond question that the flesh of beeves suffering when killed from splenic fever will produce this disease in the human subject.

Dr. Rohé discussed at some length the different measures for preventing dangers in foods. He said:

"Maryland has passed laws in the interest of the consumer looking to the detection and prevention of fraud in the sale of food. The compulsory inspection of canned oysters is one of these beneficent acts. There is, however, no provision in the statutes, so far as I am aware, which protects the consumer against diseased or tainted meats, adulterated or diseased milk, or poisonous canned food.

"The State must inspect, through competent agents, all articles sold as food which are liable to produce disease. The milk, cheese, meat and fish must be regularly inspected before being offered for sale. All food animals must be inspected both before and after slaughter, and the sale of diseased meat strictly prohibited. Splenic fever, contagious pleuro-pneumonia, foot-and-mouth disease, cattle or swine plague, can be detected in animals suffering from these diseases. After death the gross and microscopic pathological conditions will give similar information. Pork should always be examined microscopically for evidences of trichinæ and cysticerci. It is manifest that such inspection cannot be carried out in a city unless the slaughtering is done at a limited number of places. A centralization of the slaughtering business will be necessary.

"The sanitary inspector of food should also ascertain the conditions under which milk-giving animals are housed and cared for, and whether care is taken to prevent infection of milk by the germs of specific diseases. The mere physico-chemical examination of milk, as practised in some cities, can only prevent fraud, but is no safeguard against diseased milk.

"It is clearly evident that a person competent to intelligently perform the duties required of the official here denominated the inspector of food, cannot be found among those who seek position merely as a reward for party service, or because they have political influence. The inspector must not only be a physician or veterinarian, but he must be familiar with the principles and practice of preventive medicine, and must possess, above all else, common sense and sound judgment.

"But the mere inspection of food will not be sufficient to prevent the dangers which exist. Power must be given the health authorities to take such action as is necessary to protect the public. If loss results to individuals through no fault of theirs, the State must reimburse them. Vested rights must be respected, and legitimate business must not be obstructed or otherwise injured. If any one, however, wants to prosper at the expense of the health of his fellow-man, let him suffer a just penalty.

"Among the individual prophylactic measures against unwholesome food, the first is to reject all articles which, from their appearance, taste, or *price*, are open to suspicion. Uncleanliness, beginning decomposition, unusual taste, odor, or appearance of food, should be sufficient reason for avoiding its use. Pork should always be sufficiently cooked in order to destroy the life of trichinæ or other parasites, and this procedure will likewise render poisoning by diseased meat or other kinds less likely to happen. Milk infected by the germs of various diseases will probably lose its infective character after thorough boiling, although too much confidence must not be placed in this. In selecting canned goods, those cans which are swelled out at the ends, showing partial decomposition of the contents, or which exhibit evidence of having been reprocessed, which is easily detected by the presence of a second sealed vent in the cap, should be rejected. It would also be safer to avoid the use of any canned goods which have been put up longer than one year. There seems good reason to believe that most cases of poisoning by canned foods have resulted from articles which had been kept a long time. Any personal idiosyncrasy concerning an article of food should be sufficient to enjoin its use. Shell fish should not be eaten out of season."

SECOND DAY, SEPTEMBER 18TH.

The second day's sessions of the council were more largely attended than the session the evening before. A number of papers were read and discussed.

NEED OF A MORGUE.—Dr. John Morris, of this city, read a paper setting forth the necessity for a morgue in Baltimore. Baltimore, he said, is, perhaps, the only large city in the country without an institution to protect the bodies of unknown and

unclaimed dead. This condition of things was considered a gross violation of decency which may lead at times to the obstruction of justice. Dr. Morris gave numerous illustrations of the inconveniences which resulted from the absence of a city morgue, and he urged the convention to appoint a committee to bring the matter before the City Council.

Dr. Jas. A. Steuart endorsed Dr. Morris' views, and referred to his efforts, as Health Commissioner, in trying to have a morgue erected. He said that after having bills twice passed for the erection of a morgue, they were both times vetoed by the Mayor, who at one time excused his veto by saying it was a luxury, and not a necessity.

A committee of five, consisting of Drs. Morris, Jas. A. Steuart, C. W. Chancellor, A. B. Arnold and G. H. Rohé was appointed to call the attention of the City Council to the necessity of erecting a morgue.

"TYPHOID FEVER IN ELKTON" was the title of the next paper, which was read by Dr. C. W. Chancellor. Elkton is a village situated on the Philadelphia, Wilmington and Baltimore Railroad, fifty-two miles from Baltimore. About the middle of July last there was an outbreak of fever in the town. After investigating the usual sources from which this disease is most likely to have proceeded, Dr. Chancellor traced the origin of this epidemic to a dairy, which was shown to be the direct cause of the trouble. A well was found contaminated with sewage, and the water from this well used in cleaning cans was the medium through which the diseased germs found their way into the milk. Dr. Chancellor called especial attention to the importance of using pure water for dairy purposes, as well as for drinking purposes. He gave facts to show that impure water either directly or indirectly aids in disseminating two of the most fatal diseases which affect the human race, typhoid fever and cholera.

A paper was read by Dr. Jas. A. Steuart, Health Commissioner of Baltimore, entitled, "ARE WE TO HAVE CHOLERA? AND HOW TO PREVENT IT." Dr. Steuart was of the opinion that effective quarantine was salutary in warding off pestilence, but he held that the real danger is from passengers and baggage embarking from a non-infected port in a ship bearing a clean bill of health and having had no sickness on board dur-

ing the voyage, but who came from infected interior places where cholera prevails. No amount or character of inspection of persons alone will suffice to prevent the importation of cholera to this country while the disease exists in Europe. Dr. Steuart concluded that the disease could be warded off, and that cleanliness, pure air, pure water, careful feeding and proper clothing constitute a barrier against the disease under all circumstances and in all places.

Referring to the question, Shall we have Cholera in Baltimore? Dr. Steuart said:

"I may answer with confidence that the conditions which obtain in Baltimore are decidedly antagonistic to the development of a serious epidemic of cholera. With the exception of a few old pump-wells (a most pernicious remnant of antiquity), which must be condemned and done away with in spite of the ignorant prejudice in their favor, the water supply of Baltimore is exceptionally pure and abundant, and coming as it does from a long distance through tight conduits, the chances of impurity are reduced to the minimum. The habits of our people taken *en masse* are cleanly and our food supplies abundant and generally wholesome. The streets are clean, and the removal of offal and excreta is well regulated. The undulating surface of our city facilitates rapid drainage, and the air, in general, is pure and healthful. The quarantine department of Baltimore is second to none in the country—appropriately situated, completely equipped, and under the control of a capable and conscientious medical officer. It has been observed in all epidemics of cholera that fear or panic enters largely as a factor into the elements of danger. This must, if possible, be counteracted; first by precept, and secondly by example, the constant reiteration of instructions through the public press and otherwise, and by the calm, intelligent and steady behavior of those who are looked up to by the ignorant and timid for aid, counsel and support. 'The true remedy against cholera is preventive medicine.'"

"THE RELATION OF THE MEDICAL PROFESSION TO SANITARY WORK" was the title of a paper read by *Dr. A. B. Arnold*, of this city. Dr. Arnold first referred to the debt which the medical profession owed to sanitarians for many important suggestions and facts relating to the prevention of

disease, and he then discussed the value of the work the practitioner might do in promoting the ends of sanitary science. The general practitioner enjoys peculiar opportunities to correct popular prejudices in relation to sanitary rules. Many erroneous beliefs prevail among a large number of people concerning questions of health. Dr. Arnold urged the profession to diffuse useful knowledge and to educate the people in such ways and means as guard against the insidious inroads of sickness.

Dr. E. M. Schaefer read a paper which was entitled "THE TWIN EVILS, QUACKERY AND PATENT MEDICINES."—The object of this paper was to show the evil results of quackery. He concluded with the following points: 1. Quack medicine is the most expensive kind to the purchaser. A medicine selling for fifty cents and properly advertised, must not cost over ten cents to be profitable. 2. Successful nostrums are composed of well-known remedies, and are often stolen prescriptions. 3. It is almost impossible for anything new to be discovered outside the regular ranks. What quack found out vaccination or patented chloroform?" He charged the clergy and religious press not to be the dupe of these ignignorant pretenders, who value only too well the protection of a holy mantle.

"THE RELATION OF THE PRESS TO SANITARY WORK" was discussed by Mr. James R. Brewer, of the *Evening News.* Mr. Brewer considered it the duty of the press to arouse the public to a sense and appreciation of its danger from neglect and dirt, and to convey to it the first and fullest information as to the best means to avoid and escape disease; to explain the proper methods of ventilating buildings, and describe the newest discoveries, inventions, remedies or suggestions in that direction.

"WHAT SHALL WE DO WITH OUR DEAD?" was the title of a paper read by *Dr. St. George W. Teackle*, in which he held that our present mode of disposing of our dead, from a sanitary standpoint, is absolutely defective. Dr. Teackle attempted to show that the cemeteries and burying-places in and around large cities were, as a rule, dangerous to the health of communities.

The subject of cremation was considered, and the adoption of this method was preferred as the most satisfactory way of returning the dead body to inorganic elements.—*Maryland Medical Journal.*

NEWPORT'S PERIL.

THE Boston *Advertiser* has the following on the sanitary condition of Newport, based largely on the report of the National Board of Health. Other papers are discussing the situation in much the same spirit. Some of the criticisms are so just that none can deny their force. The analysis of the water supply as made by Mr. Bowditch included many of the wells and cisterns in use, which were found greatly inferior to the supply from the Newport Water Works Company, and some of which are still in use. It is well to call attention to the fact that since the report was made to the National Board, great improvements have been made in the character of our public water supply, and still others are in contemplation. Very little room for complaint now exists on that score. The great need of Newport is a board of health and more liberal appropriations for cleaning streets and the prevention of nuisances. But to the *Advertiser* :—

Though Newport claims to have had a successful season this year, it is apparent there is a little uneasiness over the competition of Mount Desert, which promises to be a new Newport of a larger growth. One cause for fear of the rivalry of the new resort on the Maine coast, is the impression going abroad that Newport, on account of the excessive conservatism of its all-the-year residents, is neglecting proper sanitary precautions.

A volume just issued from the government printing-office at Washington, by the national board of health, contains the exhaustive report of the investigation made under the direction of Mr. Bowditch of this city into the sanitary condition of Newport, which is very unfavorable. Many nuisances, according to this report, remain unabated, and the drinking water, one hundred and twenty separate analyses of which were made under Mr. Bowditch's direction, is reported, as a rule, unfit for use. A plan of sewerage, suggested by Mr. Chesbrough, the Chicago engineer, was adopted by the city council last year, and some progress has been made on the work, but THE

SANITARIAN is authority for the statement that the work is being done "with such modifications and adaptations to existing old and defective sewers as to raise the question among intelligent observers whether it will not ultimately result in injury instead of benefit."

The only board of health in Newport is the aldermen, who have not shown the slightest disposition to abate nuisances, or change the existing state of affairs. There is a local Sanitary Protection Association, composed mostly of summer residents, which has not ceased to agitate for a separate board of health, and for other sanitary reforms; but this association is stupidly regarded, by the majority of the voters of Newport, as an organization which is working to the injury of the city by spreading abroad reports of its insalubrity. It is enough to condemn any measure in Newport to let it be known that it has the favor of the Sanitary Protection Association. In the meantime, the more far-seeing residents apprehend a day of reckoning for the sanitary neglect of the past and present, and do not hesitate to remind the opponents of measures of reform that not even the immense investments of summer residents already made at Newport will prevent the city's decline, if it does not turn over a new leaf and put into effect radical sanitary improvements.—*Newport News.*

TEMPERANCE PHYSIOLOGY.—No doubt something will be gained by calling attention to the subject, but the question is, if the method proposed is the best that could be adopted. We doubt if the appeal to science through such teachers as we have, and such books as most of those that are now appearing, to meet the new emergency, is the best way of securing the end desired. What is wanted is to make the deepest and most indelible impression upon the minds of youth in regard to the bad effects of indulgence in alcoholic beverages. But the attempt to expound the physiology of the subject is not the best way to accomplish this object. The evils of intemperance are evils which openly appear in conduct. The incontestable facts of the injurious influence of drinking are direct, palpable, conspicuous, observed by everybody, and open to no question. Science cannot make them

more clear, or add vividness to the painful facts which are seen by all. Good may come, as we have said, but it is a question if more good would not come from the dogmatic statement of facts, that are free from doubt and obscurity, and that are based upon unquestionable and established experience. The subject in its scientific aspects is beyond the grasp of pupils in common schools, but maxims and rules can be stamped upon their minds in a way that will exert a salutary and permanent influence. And if it is desired to teach the young to *think* upon the subject, then let the victims of alcoholic indulgence be taken as *object lessons*, in which what the pupil sees himself becomes the basis of the opinions he forms. Every community is full of examples of the effects of drinking, and these effects are seen in all possible degrees Let the scholars be directed to observe for themselves, and see how much truth they can find out on all sides of the subject; the exercise will, at any rate, be an excellent means of mental improvement and practical education.—PROFESSOR E. L. YOUMANS in *Popular Science Monthly* for August.

PREVENTABLE SICKNESS A DEFENCE IN LAW.—A case has recently been decided in New York, justifying the rights of a tenant to vacate a house and refuse to pay rent on the ground of unsanitary conditions. The case was: "In a suit for rent claimed to be due from a tenant of a suite of rooms in an apartment house, it appeared that the tenant's wife and servants were taken sick by inhaling a malarial or poisonous gas in the apartments occupied by them; that this unhealthy condition of the apartments was owing to a defective condition of the general plumbing work of the house, of which the landlord was notified by orders from the Board of Health, requiring him to have changes made in the plumbing work, and which unhealthy condition could have been removed if he had complied with these orders; that the defendant waited for two weeks, and finding that nothing was done on the part of the landlord, left under the apprehension that he was imperilling the health of himself and family by remaining." The case was appealed to a higher court and confirmed. It is to be hoped the practice will become general.

THE RULES OF HEALTH.

LISTEN to each simple rule,
As to conduct and to diet;
You must keep serenely cool
Though the cholera run riot.

Eat the best of all things good,
Ne'er a dish that very nice is
Hurts you, while it's understood
You avoid too many ices.

You may eat all sorts of fish,
Those who say you mayn't, talk gammon;
But a prudent man won't wish
Too much cucumber with salmon.

Flesh and fowl are yours to eat,
Every dish a toothsome comer;
But the chops of pork are meat
That you need not try in summer.

Fruit is welcome, too, I trow,
When not over ripe; at present,
Strawberries and cream, you'll vow,
Will be found extremely pleasant.

Drink the best of wine, and try
Port and claret, hock and sherry;
Champagne, when extremely dry,
Is exhilarating—very.

You may smoke, too, but take care
Your cigars are sweet as manna;
When disease is in the air,
Only use the pure Havana.

Keep yourself from worries free;
If you've lawsuits, you must gain 'em;
Thus quite easily, you see,
You'll preserve the "corpus sanum."

—*Punch.*

ON THE PRESENT AND FUTURE OF SANITARY WATER ANALYSIS.*

By MAJOR CHARLES SMART, Surgeon U. S. Army.

THE investigation by Professor Mallet for the National Board of Health marks an important period in the history of water analysis. This work was carried out in 1881; but the full report has only recently been published, and its appearance, showing definitely what value attaches to present methods, suggests an inquiry as to the future.

But, to appreciate the present and forecast the future, a brief notice of the past is needful. Usually in historical inquiries into questions akin to medicine we drop back to Hippocrates; but in this instance the dark ages lasted until most of the members of this Association had seen the light. Water, it is true, was analyzed before this recent time, but the analysis dealt, and continued to deal with the saline matters until sanitary inquirers discovered that injurious effects are seldom due to these when existing in the quantities usually present in ordinary potable water. They came, therefore, to look upon the formal inorganic analysis of the chemist, tabulated in grains per gallon, as a parade of accurate chemical work which had little bearing on the practical question of wholesomeness. They concluded that the knowledge they desired lay hidden in the intangible organic matter dissolved in the water, and they instituted experiments on it. Their methods were crude and their results lacked precision, as this obscure organic matter refused to be precipitated and brought to the balance for a rule-of-three calculation to determine its quantity. What the sanitarians wanted was what many people want at the present time—a something which, when dropped into a specimen of the water, would give information as to unwholesomeness by some striking reaction, such as a change of color or the formation of a characteristic precipitate. But the scientific chem-

* Read before American Public Health Association, St. Louis, Mo., October 17, 1884.

ist knew, from the constitution of organic matter, that the realization of this desire was as impossible as the discovery of the philosopher's stone or of the elixir of life, the pursuit of which absorbed so much of the energies of the alchemists, and discovered so much that is valuable to the human race.

The sanitary analysis of water may be said to date from the time when Forchammer of Copenhagen proposed the decolorization of permanganate of potash solution as a test for its organic matter. For a long time the status of this reaction was that of a curious laboratory experiment, as the action of permanganate on organic matter, when present in the minute quantities usually found in water supplies, was too slow and ill-defined to admit of any practical advantage from its employment.

In the meantime, the recognition of the importance of the organic matter led, in the absence of a generic quantitative test, to a chemical attack upon it by the method of ultimate or elementary analysis. As organic matter consists mainly of carbon, nitrogen, hydrogen and oxygen, it was believed that if an accurate determination of the carbon and nitrogen could be effected, an expression might be given to the relative amounts of organic matter in different water supplies, although the absolute weight of the organic substance would remain unknown. From this was finally developed the combustion process of Frankland and Armstrong, in which the residue of the water, procured by a carefully conducted evaporation, is burned in vacuo with copper oxide, and from the volume of the evolved gases the quantities of carbon and nitrogen in the organic matter are calculated. If the organic matter of water did not vary in its constitution, and were its unwholesomeness proportioned to its quantity, this would have been an excellent method of sanitary analysis. But it was readily appreciated that the organic matter collected by water is a mixture of many substances, some of which may have much carbon and little nitrogen, and others less carbon and relatively more of the nitrogen; and that while some of these substances are harmless, others may be deleterious. Animal matters, for instance, were credited with being more harmful, weight for weight, than matters of vegetable origin. But as the ratio of carbon to nitrogen is greater in the latter than in the former, the process

of Frankland and Armstrong was found to be capable of indicating, in some instances, from which of the kingdoms of nature the organic matter was derived, and in so far of suggesting the possibility of harmful qualities.

But in view of the preponderance of nitrogen in the more deleterious animal matters, and of its presence in all tissues that are vitalized (as contradistinguished from certain organic matters which, like starch and sugar, are simply the products of vital action), other experimenters regarded it alone, when accurately determined, as giving expression to the relative quantities of probably dangerous organic matter to be found in waters. The nitrogen in these organic substances was ascertained to be susceptible, in part at least, of ready transformation into ammonia, which could be estimated with great accuracy. And as the process of Wanklyn and Chapman, which is based on this transformation, required less time, special training and manipulative tact than Frankland's method, it became extensively used and carefully studied by the sanitary analysts. This process also is capable of itself, and especially in connection with another process to be mentioned directly, of affording as definite evidence concerning the derivation of the substance which furnished the nitrogen as may be obtained by the more scientifically accurate method of combustion. But although, as has been shown by the writer, it is capable of detecting and estimating the urea of undecomposed sewage, it fails, as does the combustion process, in the majority of instances to afford any direct testimony as to the character of the organic matter, and hence, as to its wholesomeness or unwholesomeness.

Meanwhile, also, the capabilities of the Forchammer test by permanganate was assiduously studied, and methods were found not only of hastening the oxidation of the organic matter accomplished by its means, but of indicating with precision the quantity of permanganate required to effect this oxidation. It was found, however, that while the quantity of oxygen used is susceptible of accurate measurement, the whole of the elements of an organic matter known to be present is not in every case oxidized. Urea, for example, is not even affected by these permanganate processes. Other matters are susceptible of more or less oxidation, so that similar results are

not obtained from equal weights of carbon and nitrogen in two or more water samples, unless the organic matters containing these weights are identical in chemical constitution. Waters containing the same kinds of organic matter may be graded in quality by these tests, but not those containing different kinds of organic matter. Nevertheless, in general terms, a water which contains a large quantity of organic matter will destroy a larger amount of permanganate than one which contains a small quantity; and hence the processes have a certain value. Dr. Tidy, whose name has been applied to one of the methods of using the permanganate, claims that animal matter is more rapidly oxidized than vegetable matter; but the experiments performed under Professor Mallet's direction to test this point, demonstrated that the animal or vegetable nature of the matter has but little influence on the rapidity of the action. If, however, these oxidations are viewed in connection with the nitrogen results yielded by Wanklyn's process, an opinion may in some instances be formed as to the origin of the matter. Thus, if a large amount of permanganate is destroyed and a small quantity of nitrogen eliminated as albuminoid ammonia, the organic matter may be considered of vegetable origin with as much certainty as if a large amount of carbon and a small amount of nitrogen had been found by the combustion process, while converse results would indicate with as much probability an animal derivation.

It is readily seen that none of the processes mentioned convey more than that the water contains more or less of the element of organic matter. But their authors have claimed for them the capability of deciding on the quality of a water by establishing limits on the scale of relative impurity within which a water is to be accounted wholesome, and beyond which it is to be considered suspicious or dangerous. In England these limits are accepted as the dicta of the authorities; and they are entitled to consideration as embodying the opinions of men who have had a large experience, biassed perhaps by a partiality for, or advocacy of, a given process. But it is doubtful if any of the analysts of this country in making use of the processes have accepted without question the rules laid down for formulating the results into an opinion on the quality of a water. In fact, this doubt as to the value of the opinion based on the analyti-

cal results developed the investigation so thoroughly carried out by Professor Mallet for the National Board of Health. Proof was required that waters which fell within the limits were wholesome, and that those which exceeded them were more or less harmful. To elicit this, a number of water-samples were procured and submitted to the three methods of analysis, by chemists who were in ignorance of the history of the waters on which they operated. Some of these waters were known by long experience to be productive of no harmful effects; others were regarded on more or less sufficient evidence as of doubtful or dangerous quality; while others, again, were specially contaminated with various organic substances, which are likely to find their way into water-supplies. Of 19 natural waters which were regarded as wholesome, only 5 were pronounced good by all the processes, although 8 others were returned as good by some, and as fair, medium, or allowable by the others; 3 were accounted bad by one of the processes, 1 by two of the processes, and 2 by all other processes. Of 20 natural waters of doubtful but more or less suspected character, 9 were reported good or allowable by all the methods, 5 bad by one method, 3 by two methods, and 3 by all the methods. Of 20 natural waters which there seemed fair ground for believing had actually caused disease on the part of those drinking them, 10 were accounted good or allowable by all the processes, 6 bad by one of the processes, 1 by two of the processess, and 3 by all the processes.

In view of this record Professor Mallet appears fully warranted in concluding that—"It is not possible to decide absolutely upon the wholesomeness or unwholesomeness of a drinking water by the mere use of any of the processes examined for the estimation of organic matter, or its constituents."

These results placed on a basis of experimental proof the opinion held by the analysts of this country, that the processes were valuable only as estimating with more or less accuracy the quantity of the organic elements present in water; but that the wholesomeness of the water, depending on the quality of the matter and not on its quantity, could not be determined by the analytical results. The words *good*, *fair*, *usable*, *allowable*, *doubtful*, *bad*, *foul*, etc., had at first been used by them not so much with the intention of expressing a positive opin-

ion as of conveying an appreciation of the results of the analysis to those who were not acquainted with its technicalities. That the sum of the organic elements, the free and albuminoid ammonia, or the oxygen required for the oxidation of organic matter, amounted to so many parts per 100,000 of the water, conveyed no meaning to the uninitiated, and required translation into an expression that could be understood. *Good, usable, foul,* etc., meant, therefore, merely that the results were similar to those which the analyst had obtained from waters known on more or less satisfactory grounds to be wholesome or otherwise. There was thus an apparent acquiescence in the principle of the British limit of wholesomeness, although not an acceptance of a specified limit. But afterwards these adjectives became in many instances the expression of an actual opinion, though not based entirely upon the analytical results. The quantity of the organic matter as determined by the chemist, led to inquiries into its derivation, with a view of throwing light on its quality. Many of these inquiries were conducted in the laboratory, as a part of the systematic analysis. The quantity and character of the dissolved solids, the chlorides, nitrites and nitrates, when considered in connection with the various points developed by the albuminoid and permanganate processes, often discovered much of value concerning the probable quality of the organic matter. The tables in Mallet's report giving the analytical results in the series of 140 waters examined, contain also the remarks of the analysts on the probable history and character of each water. These are interesting as showing how closely in most instances they approached the truth, and as suggesting that since the analysts had discovered so much concerning the organic matter, an inspection of the source and surroundings of the water-supply would enable them to point out the origin of the contamination. A knowledge of the history of the water-sample, taken in connection with the results of the analysis and with a knowledge of the normal characteristics of waters of similar history, will in all likelihood permit an opinion to be formed concerning the probable derivation and quality of its organic matter. This opinion necessarily modifies that which is based solely on the analytical results; for a water need not be reported as bad if its organic matter, although large in quantity, is mani-

festly harmless; and on the other hand, a caution may be necessary concerning the use of a supply, if its organic matter, although trifling in quantity, is of manifestly dangerous origin.

The two natural waters, which were believed from actual use to be of good wholesome character, yet were condemned as bad by all the analytical methods in Mallet's investigation, were the Cochituate water of Boston and the Mississippi River water of New Orleans. The quantity of organic matter in both exceeded the limits of wholesomeness assigned by the English authorities. But in these cases it would seem that the testimony as to their good and wholesome character may be questioned with as much propriety as the opinion based solely on the analytical results. Sewage in water may or may not be harmless—neither position has been proved. But it has been proved that after sewage has been in the water for some time it ceases to be sewage. Its organic matter becomes transformed into organic substances, and the water not only gives satisfactory results on analysis, but is probably wholesome. The organic matter of sewage containing the typhoid poison likewise becomes transformed, but the water, although giving satisfactory results on analysis, may be far from wholesome; for the transformation into ammonia and nitric acid which takes place in ordinary sewage matters does not affect the germ of that disease. Well waters which on more or less satisfactory evidence have been associated with the spread of typhoid fever, have been found free from organic matter on analysis, though showing by the nitrates or nitrites present that they had not always been free from it. The typhoid germ is therefore believed to be capable of resisting the destroying influences by which ordinary dead organic matter is reduced. River or lake waters which are exposed to sewage contamination must also be considered of doubtful quality, irrespective of the analytical results, until the cases of typhoid fever that occur in the cities supplied by them are traced to other sources than the water-supply. Recent researches with which you are all familiar, indicate that cholera may be propagated by the diffusion of its microbe in water, and the theory that malarial fevers are due to a micro-organism which may enter the system with the drinking water is not without support.

In fact, it is not the dead organic matter in a water that

renders it dangerous, but the minute and unknown organisms which are living, and perhaps growing and multiplying in it. There is ample proof that to cause intestinal troubles, the dead or putrescent organic matter, whether vegetable or animal, must be present in quantity easily recognized by the senses. At the same time the evidence is convincing that the organic matter, which should be the special object of sanitary analysis, is not to be detected by any purely chemical process.

It does not follow, however, that the work of the sanitary analyst is without value. So far as our knowledge extends, these micro-organisms are on the one hand connected with vegetable decomposition, and on the other with sewage. The detection of either of these points to a possible danger which in every instance should be avoided. Sanitary inspection is frequently able to indicate this danger; but where it fails to do so, chemical analysis will usually succeed. When an excess of organic matter is detected, and especially when its character is appreciated, a close investigation into the surroundings of the water gives full promise of discovering the source of the pollution. As a case in point: The cistern water at a gentleman's summer residence was suspected of having caused typhoid fever. The cistern was cleaned out and put in what seemed to be perfect condition, but the water on analysis was found to contain, with other organic matter, a certain quantity of undecomposed urea. The owner declared this to be simply impossible; but when the cistern was again emptied and subjected to examination, it was found to present three apertures of inflow, while only two conductors connected it with the roof. This discovery led to the remembrance that some years before certain alterations had been made in the building; and the third aperture was supposed to be the mouth of a disused conductor. This was found to be the case: the other end of the pipe was unearthed just below the surface near the porch, where grew some vines that were occasionally nourished with chamber slops.

Chemical methods are therefore of value, though they do not indicate the presence of the particuiar virulent matters which render drinking water dangerous. It is impossible for them, in view of the principles on which they are based, to pronounce on the actual presence or absence of danger, but they afford

the surest means of determining the possibility of danger. The true position of these chemical methods should be appreciated by sanitary workers, that some of the energies spent upon them may be diverted into channels which promise more definite results. The living organisms should become the subject of persevering study. More than a dozen years ago Burdon-Sanderson called attention to the bacterial fecundity of water. He added a few drops of the water under examination to a sterilized and protected nutritive liquid, and suggested that the quality of the water in some respects might be ascertained from the density of the resulting bacterial turbidity and the rapidity of its development. But although the culture method as applied to water was thus long ago suggested, the idea has not been followed up, except in a few of the European laboratories; under Koch's direction, for instance, tests of the bacterial fecundity of the Berlin water-supply, are made daily by the culture method. The pursuit of the elements of organic matter has carried the analysts past the real object in view; but it is time that their retorts and combustion tubes should give place, in part at least, to the microscope and culture experiments. These offer the best prospects of a solution of that difficult sanitary problem,—the quality of our water-supplies. Ultimately they will probably render the chemical methods unnecessary. By working in this direction the analysts will prepare themselves for the change of methods, while their labors will undoubtedly hasten the arrival of the time, when they will be able to give an opinion embodying certainties instead of probabilities—when they will be able to say with truth that a given sample of water is wholesome or unwholesome, as the case may be.

HOW THE BEDOUINS CONQUER THIRST.—In an article on "The Rescue of Chinese Gordon," to be found in "Open Letters" of the September *Century*, General R. E. Colston, late of the Egyptian General Staff, says: "In the 'Waterless Land,' water is the paramount question. If it be asked how a large body of Bedouins like the ten thousand who nearly destroyed the British squares at Tamaï manage to subsist, the

reason is plain. In the first place, they do not need the enormous trains required for a European army. They are the most abstemious of men. Each man carries a skin of water and a small bag of grain, procured by purchase or barter from caravans. Their camels and goats move with them, supplying them with milk and meat, and subsisting upon the scanty herbage and the foliage of the thorny mimosa, growing in secluded wadies. These people could live upon the increase of their flocks alone, which they exchange readily for other commodities; but being the exclusive carriers and guides for all the travel and commerce that cross their deserts, they realize yearly large amounts of money. As to water, they know every nook and hollow in the mountains, away from the trails, where a few barrels of water collect in some shaded ravine, and they can scatter, every man for himself, to fill their water-skins. On my first expedition, near the close of the three years' drought, I reached some wells on which I was depending, and found them entirely dry. It was several days to the next wells. But my Bedouin guides knew some natural reservoirs in the hills about six miles off. So they took the water camels at night-fall, and came back before daylight with the water-skins filled. An invading army would find it hard to obtain guides, and even if they did, they must keep together, and could not leave the line of march to look for water. Besides, the Bedouins, accustomed from infancy to regard water as most precious and rare, use it with wonderful economy. Neither men nor animals drink more than once in forty-eight hours. As to washing, they *never* indulge in such wasteful nonsense. When Bedouins came to my camp, water was always offered them. Their answer would frequently be: 'No, thanks; I drank yesterday.' They know too well the importance of keeping up the habit of abstemiousness. No wonder they can subsist where invaders would quickly perish."

TONGALINE.—For obstinate cases of neuralgia and rheumatism due to malaria, a correspondent of *Medical Brief* strongly recommends *tongaline* in combination with quinine, in the proportion of one teaspoonful of *liquor tongee salicylatus* to from two to five grains of quinine, every five or six hours till relief is obtained.

HYGIENE OF THE HABITATIONS OF THE POOR.*

By Major Samuel A. Robinson.

THROUGH the invitation of the President of the American Public Health Association, I come to take part in your deliberations and to present the opinions and views which an experience of six years in connection with the Health Department of the District of Columbia, has enabled me to form on a subject that appeals alike to the philanthropist, the scientist, and the landlord. I shall attempt a practical statement of the errors that have been committed in the construction of the habitations of the poor, errors which, I am satisfied, have bred great distress, disease, and death among this particular class of people; and will also endeavor to point out the improvements necessary to render their homes and places of abode what they ought to be, to insure comfort, cleanliness, and health. While most of the ideas I may offer are new to the average householder, since they refer to that part of house building hidden from view; yet I am quite aware that, to many here, the story has been told oftentimes before, and by men who are much my superiors in scientific attainments, together with larger experience in this important branch of study. I venture however to occupy your attention, hoping to promote such a discussion as will develop and accentuate the knowledge we already have, and encourage an interest not only on the part of those present, but so stimulate the efforts of sanitarians and persons having sanitary authority, all over the country, that a change and a reform may be brought about in the construction of the tenement-houses, school-houses, and workshops, where the poorer classes live and congregate. Laws thus procured by our influence should be made to apply with equal force to the buildings constructed before the enactment of laws regulating the drainage and plumbing in new houses. Where we have not

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sufficient authority, let us make it so plain by our work and our reports that the proper authorities may acknowledge the necessity for additional legislation, and urge the passage of laws, by every municipality in the land, requiring the most stringent regulations governing all classes of work in connection with the habitations of the poor, affording besides to tenants who exercise ordinary care the requisite facilities for keeping their houses in good sanitary condition. The ignorance, want of proper training and recognition of the rules of sanitation on the part of this class of people, render it of vital importance, not only for their own preservation and health, but for the comfort and health of their more affluent neighbors, that landlords should be compelled to supply them with proper house accommodations; and that suitable means should be adopted for their education in sanitation. This latter purpose can only be accomplished through the medium of the most rigid house inspection, and the infliction of penalties for violation of rules of health when their acts or neglects are the means of injury to others than themselves. These are practical questions for our consideration which must be approached in a practical way, and by minds capable of appreciating the full force and effect of the existing evil system, as well as grappling with the difficulties which attach to it.

The community has obviously the right of self-protection by restrictions upon the construction of the dwellings of its inhabitants, as well as a supervision of its food and water supply and the removal of waste. It is for the protection of communities that the profession of sanitary engineer—a coinage of quite recent date—has been brought so prominently to the front, and specialists and scientists in the medical and other learned professions, are eagerly searching for new truths and formulating new regulations in this problem of self-protection. The rich encourage the enforcement of all reasonable sanitary regulations; the well-to-do citizens are generally offering no obstruction; while the poor resist every new or unusual investment which adds to the cost of living. The poor are in a measure the wards of the community in which they live, and no unnecessary hardships should be laid on them; nothing beyond the plain requirements of sanitary laws should be insisted upon, and above all, the poor should be spared the burden of experi-

ments. New and untried theories should be tested at the expense of the rich.

If we consider the dwellings of the poor in my own city of Washington, we will find small houses, usually occupied by a single family. Houses of recent construction, though not generally secured from the noxious air rising from the soil, and otherwise cheaply built, are all provided with separate and secure drains of heavy cast-iron, amply ventilated and trapped from the public sewers. Houses in the outskirts of the city, of earlier construction, are generally unprovided with drains, privy boxes being in common use. Where ground is cheap and plenty, as in Washington, this system of separate tenants will fortunately continue the rule, and secure construction becomes very simple. The choice of site, which is the first consideration, should be governed by the presence or absence of dampness, and the municipality should prohibit the erection of houses on a damp foundation until the evil is corrected by efficient sub-surface drains. Where these drains discharge into the sewer the nicest care should be exercised to prevent the return of sewer air. Such drains should be of agricultural tile, laid with open joints at top, with loose covers to prevent obstruction of the joints, using care to leave no opening through which rats or mice may pass. Water so collected should be discharged into a cemented well of say two gallons capacity, from which a three-quarter inch lead or galvanized pipe, having a metal ball similar to Cudell's trap, may connect with the public sewer. The absence of dampness being secured, the modest structure, generally consisting of four rooms, all with ample light, may be erected. The chimneys should be sufficient for the escape of smoke and the ventilation of the apartments. The entire surface of the ground within the walls of the house should be covered with four inches of Portland cement to prevent the rising of ground air. Such work is usually very carelessly done or entirely neglected, yet it is of prime importance.

It is desirable that each house should have a separate connection with the public sewer. This drain should be of four-inch cast-iron pipe well tarred, with a running trap outside of house and fresh air inlet for ventilation. The vertical extension should be four-inch cast-iron pipe or wrought iron with screwed

joints, carried full size above the roof of house. Where the combined system of public sewers exists the rainfall and house sewerage are discharged into this drain.

The number of fixtures, such as sinks, water-closets, and bath-tubs, are regulated by the ability of the occupants of the house. It is chiefly the water-closets with which we have to do, though the waste connections of every fixture is subject to municipal regulations and guarded with equal care. Each water-closet must have a flushing tank with ample arrangements for efficient flushing of the traps. Every fixture having connection with the drains should be exposed for inspection where practicable. Water-closets, sinks, basins, etc., should not be boxed about. Water-closets should be entirely of delf-ware, with ample flushing rim and trap of same ware. Cast-iron or other metal traps should be prohibited. Valve closets of every description, from the old pan closet with its receiver loaded with excremental filth, to the newest patent side outlet, ball valve sanitary closet with germicide attachment, should be abated or prohibited. The simplest are the best. The class of closets known as washout closets are numerous and reliable. The syphon closets and short hoppers with delf-ware traps above the floor give sufficient variety for selection, and all others should be avoided.

An important question connected with the healthiness of dwellings is the mode of carrying off human excreta, garbage, and ashes. I think a contract made with one party for the removal of all this refuse is the safest, he to utilize it as he deems best, but to be subject to the most stringent rules of the Health Department as to the manner in which his work is done. Earthenware receptacles, glazed on the inside, somewhat smaller than the wooden box commonly used, should be adopted, and so located in an outhouse as not to be exposed to the rain or weather, and the tenant required every day to sprinkle a small quantity of ashes over the contents, and this box should be cleaned at least every two weeks by the contractor. The system of requiring tenants to pay for removals is a bad one, as it entails an expense that many of the poorer classes cannot afford, and tempts them to resort to all kinds of tricks to escape. Sometimes the ordure is buried in the ash pile, and often in the sewer traps of the nearest alley. It can be removed in

an odorless way by means of pump, hose and air-tight barrels, having an opening in the head of barrel the size of an ordinary hose coupling.

Ashes should be taken away by the contractor as often as it is necessary to remove the garbage, and it is not safe to allow the garbage to remain longer than two days at a time on any premises, although it is a common practice to regulate these removals by the size of the dwelling. The poorer classes invariably make a nuisance of this refuse, either by holding it for a country cousin who owns hogs, or when it accumulates beyond the capacity of the small receptacle they may have for it, by dumping it in the alley or on the nearest vacant lot, creating a nuisance injurious to the health of the entire neighborhood. For these and other reasons the removals should be frequent and prompt, and the contractor held strictly to a faithful performance of his duty or forfeit his contract.

Garbage should be removed in iron-bound barrels having close-fitting covers. All excreta and garbage should be quickly carried out of the city to some remote locality in the country, where it should be placed in a pit mixed with earth and returned to the soil for fertilizing purposes. Various analyses show it to be six times more valuable than the excreta of the horse, and eight times that of the cow. All that we need is a safe way for its collection and disposal, and a more scientific method for preventing its deterioration. Leibig, in his work on chemistry in its application to agriculture and physiology, says: "The Chinese are the most admirable gardeners and trainers of plants, for each of which they understand how to prepare and apply the best adapted manure; very little value is attached to the excrements of animals. Indeed, so much value is attached to the influence of human excrements by these people (the Chinese) that laws of the State forbid that any of it should be thrown away, and reservoirs are placed in every house in which it is collected with the greatest care, and the vessels are removed daily as carefully as our farmers remove the honey from the hives."

The construction of the mammoth tenements for the poor in our principal cities is a more complicated matter. To secure light and ventilation for each apartment; to have all rooms containing plumbing fixtures with direct openings to outside

air and light; to preserve privacy in the use of such fixtures; to allow ample hall-ways for the decent isolation of the families; to give sufficient stairways, independent of the elevators for escape in case of panic from any cause; to obtain open grounds for healthful exercise; to guard against the loss of life by fire; to furnish storage and facilities for handling fuel as well as laundry and drying space; to avoid the use of deleterious wall-papers; to protect each tenant from pollution of the atmosphere of another apartment by communication through the hall; to supply all safe and proper appliances for heating rooms; to provide convenient means for the removal of garbage and ashes, are all of prime hygienic importance.

There should be no scrimping of the public money whenever there is a demand for it by a competent board of health, but the most liberal appropriations should always be made for this, the most useful branch of the public service. The sanitary laws should be rigidly enforced, and there should be no waiting for an epidemic to awaken us to a sense of our duty, and then cause us to expend large sums of money in cleaning foul places which should always have been kept clean.

Professor W. H. Brewer, in his paper to the Common Council of New Haven, expresses himself most forcibly upon the subject. He says: "Cases might be cited where a pestilence has proved a blessing in the end by scaring people into the means for promoting the public health, and thus greatly lessening sickness, lowering the death-rate, and educating the people into living more cleanly lives. Suppose that a tenement-house in this city was on fire, its inmates in danger, and the physical means of saving their lives were simple and at hand, but the firemen had neither the legal right nor the legal power to use them. If but a single life was lost, laws would soon be made to suit similar emergencies in the future. Or suppose the firemen were legally prevented from using such methods as they knew had been effective elsewhere, and the victims left helplessly to perish, how long would it be before the cruel laws would be repealed? Yet every year we see many lives lost, not only in tenement-houses, but also in the houses of well-to-do citizens, from diseases induced or aggravated by bad plumbing, faulty drainage, or other preventable causes, whose lives might have been saved were the people as

wise and alert in sanitary matters as in that of fire, and public opinion as earnest in maintaining organized protection against the one class of dangers as the other."

"We now want some of the legal safeguards erected against the danger of slow death by preventable disease, which are already provided against sudden death by accident. We have guarded against the lesser causes of preventable death, now let us be equally earnest and enthusiastic in guarding against the greater danger—that from accumulated and accumulating filth. We want a plumbing and house drainage law with the means and power for its due administration. We want a law forbidding the building of any privies or cesspools on sewered streets."

Exceptionally strong powers are conferred upon the health authorities in the city of New York, and yet they have been slow to act in regard to the swarms of Italians, Polish Jews, Chinese, and Irish, in some of the tenement-houses in that city, notwithstanding the earnest protests of the *Sanitary Engineer*, a journal ever foremost in the cause of sanitary reform, and always abounding in information invaluable to every household. The owners of all buildings of this character should be found and forced either to tear them down or make them habitable. Experience teaches us, wherever stringent means have been adopted requiring tenants to occupy other quarters and to live more in accordance with the customs of civilized beings, that these houses, when condemned and unoccupied, have soon been levelled to the ground, and new substantial and healthy houses for the poor have taken their place. It is the duty of every municipality to act now just as they would be compelled to do if the cholera or yellow fever were raging in their midst, with a death-roll of two thousand a day. Disease that always takes its rise in the habitations of the poor at this moment hovers over the palace of the Pope of Rome. In the cities of Toulon, Naples and Marseilles the poor revel in filth. Death has held a carnival in the beautiful cities of France, where the wealthy of all nations resort for pleasure and recreation. What city in the country should so shrink from the desolating presence of cholera as St. Louis, the Queen of the West, whose experience has been so direful in the past? Who can forget that in 1849 whole families of the wealthiest

and the best of the land were swept away by this wasting pestilence? Are we in a condition to meet this dreaded visitor next year? Remember that cities which have adopted and strictly enforced sanitary laws have in a measure escaped disease.

The three great works on which the future of Washington City depends—the improvement of the sewerage system, the increased water supply, and the filling in of the flats—are being pushed forward as rapidly as the appropriations by Congress will admit of. As a result of these and other improvements, capitalists will continue to invest in Washington City real estate, beautiful houses will be built, and the taxable property will rapidly increase. As this march of improvement goes on, we must not lose sight of the dark spots upon this bright and beautiful picture, but strive to root out the ragged fringe of dilapidated frame shanties on the outskirts of our city, and encourage capitalists to invest in new and healthy habitations for the poorer classes. We confidently expect Congress, at its next session, to give us the power to regulate the sanitary conditions of all houses, both old as well as new; then, and not until then, can Washington be called a perfectly healthy city.

"I once took a distinguished statistician of France," says Dr. Southwood Smith, "to some of the habitations of the poor in London, and showed him the sick with typhus lying in their wretched beds, for the sick with typhus may be seen there every day of every year. After the painful inspection he exclaimed, 'England is indeed adorned with a splendid mantle, but under it are concealed the greatest horrors.' Determined that this eminent person should see both sides of the picture, I next took him to see the model dwellings. What are the model dwellings? Small plots of civilization in the wide waste of barbarism. 'In what does this civilization consist? In very simple matters. The subsoil drainage of the site of the building; the free admission of light and air to each inhabited room; the abolition of the cesspool, involving complete house drainage; an abundant supply of water, and the immediate removal by it of all refuse which it is capable of holding in suspension, and means for the removal of house refuse not capable of suspension in water. And this is all. And what are the results of these few and simple arrangements? That the mortality among the inhabitants of these dwellings is less than that of London

generally, and far less than that of some of the filthy and neglected localities of London. That there has not been a single death from typhus or any other form of continued disease among the adults in any of these buildings since their establishment. Such are the results of the first imperfect attempt at improvement, which, remarkable as they are, are not more striking than the results of neglect. We see the first steps that must be taken to elevate the people; nay, even to bring them within the pale of civilization already attained. We must improve their sanitary condition. Until this is done no civilizing influence can touch them; the school-master will labor in vain; the minister of religion will labor in vain; neither can make any progress in the fulfilment of their mission in a den of filth. Moral purity is incompatible with bodily impurity, moral degradation is indissolubly united with physical squalor. The depression and discomfort of the hovel produce and foster obtuseness of mind, hardness of heart, selfish and sensual indulgence, violence, and crime. It is the home that makes the man; it is the home that educates the family. It is the distinction and the curse of barbarism that it is without a home; it is the distinction and the blessing of civilization that it prepares a home in which Christianity may abide, and guide, and govern."

WHAT THE CHOLERA HAS COST.—It will be a nice problem for the statisticians presently to determine what the latest visitation of the cholera in Europe has cost. A week or two ago it was calculated that the quarantine had already resulted in a loss of £1,600,000 to the Italian revenue, and now the Spaniards have begun counting their bill of costs. The falling off in customs since quarantine was established had amounted by the end of August to close upon £250,000, while the value of the exports and imports during the same period had shown a decrease of £675,000. No wonder that the corporations of Madrid and Barcelona have petitioned the Government to take these facts into consideration. The Minister of Finance, finding that the equilibrium of his budget was being seriously disturbed, has persuaded his colleagues that it is time to have done with the quarantine craze, and with the beginning of the present month the regulations have accordingly been relaxed.—*Pall Mall Gazette.*

EDITOR'S TABLE.

AMERICAN PUBLIC HEALTH ASSOCIATION.

The Twelfth Annual Meeting of this Association held in St. Louis, October 14–17, 1884, was characterized by a goodly attendance, and an unusual number of papers illustrative of practical work. The local committee, headed by Dr. Spiegelhalter, had spared no pains in securing a commodious and well-appointed place of meeting in Liederkranz Hall, where the sessions were promptly commenced at ten o'clock on the 14th inst., the president, Medical Director A. L. Gihon, in the chair, and continued morning and evening daily, and an afternoon session on the second day, until twelve o'clock on the 17th, when the Association adjourned to meet in Washington, D. C., December, 1885, with several excellent papers read by title only, and referred to the Committee on Publication.

A particularly noteworthy event was generally known at the opening, that a highly appreciative member and public-spirited citizen, HENRY LOMB, Esq., of the firm of Bausch & Lomb Optical Co., Rochester, N. Y., had offered the sum of $2,000 to be divided into four prizes of $500 each, for essays on practical subjects connected with the purposes of the Association. A special committee was appointed to confer with Mr. Lomb for the arrangement of the details and designation of subjects, which resulted in a resolution adopting the following series:

No. 1. Healthy Homes and Foods for the Working Classes.

No. 2. The Sanitary Conditions and Necessities of School-houses and School Life.

No. 3. Disinfectants and Individual Prophylaxis against Infectious Diseases.

No. 4. Appliances and Means of Saving Life, and for Protection against Injurious Influences of Occupations upon Health.

A second resolution was adopted, authorizing the appointment of prize committees, of three each, for the several ques-

tions, and requesting the National Board of Health, and the State Boards of Health Conference to add one each—making the committees severally to consist of five members. The following were appointed by the Association:

(1.) Drs. E. M. Moore, P. C. Conn, and A. L. Gihon.

(2.) Hon. Erastus Brooks, Drs. H. P. Walcott, and C. W. Chancellor.

(3.) Drs. S. S. Durgin, J. E. Reeves, and Gustavus Debron.

(4.) Drs. E. M. Hunt, A. N. Bell, and Geo. M. Sternberg.

It is understood that the time fixed for No. 3 is April 1, 1885. The others will be extended to the time of next meeting of the Association—in Washington, December, 1885. Completion of the details will be announced hereafter.

After the usual miscellaneous business of opening the session, Dr. Irvin A. Watson, Secretary, and Chairman of the Committee on Necrology, reported that since the last annual meeting the following members of the Association had died:

Dr. J. T. Gilman, Portland, Me.; John J. Holbrook, Keene, N. H.; Dr. Warren Stone, New Orleans; Dr. Robert J. Farquharson, Iowa; Dr. H. Ryan, Colorado City, Tex.; Elisha Harris, Albany, N. Y.; Professor S. D. Gross, Philadelphia; Dr. Fred. Lente, New York; Dr. Willard Parker, New York; Dr. W. Sheehan, Rochester, N. Y.; C. W. Chamberlain, Hartford, Conn.; Gen. J. M. Cuyler, U.S.A., and Dr. Joseph J. Woodward, U.S.A. Memoirs of each of the deceased members are to be printed in the Official Minutes of the Association's proceedings.

Papers were next read as follows:

On "The Hygiene of the Habitations of the Poor," by Major SAMUEL A. ROBINSON, A.M., Inspector of Plumbing of the District of Columbia; "The Squalid Dwellings of the Poor, a Social and Sanitary Reproach," by CHARLES W. CHANCELLOR, M.D., Secretary of the State Board of Health of Maryland; "The Sanitary Survey of a House," by WILLIAM K. NEWTON, M.D., Health Officer of the City of Paterson, N. J.

Major Robinson's paper will be found in full on other pages. Dr. Chancellor's will be published in a future number.

"The Sanitary Survey of a House," by Wm. K. Newton, M.D., Health Officer of the city of Paterson, N. J., was a narration of the method practised in that city for the determination of the relative sanitary qualities of any house. Health officers were given blanks on which certain questions and directions were printed, giving the necessary qualifications of a perfect house. The degree of sanitary excellence was made up from the reports of officers, who would cross off the qualities a building did not possess and allow those it did to remain. The first thing to be considered was the street on which the house was situated. Was it made allowing a free current of air to circulate, or narrow; well kept, or in bad condition; clean or dirty? Streets paved, how? Which way does the house face—north, south, east, or west? (In order to ascertain whether it received much or little sunshine.) Were trees in front of the house? (Trees would be a blessing in a wide street, tempering the rays of the sun, but in a narrow street they would cause disease by obstructing the rays of the sun and making the front rooms damp and unhealthy.) The next point of interest was the yard. Notice whether garbage is allowed to accumulate; the water supply, and whether there are any sources of contamination; whether domestic animals are allowed in the yard. Then go into the house, visit the cellar and see whether the foundation is of stone, brick, or rubble. The ventilation of a house, method of heating, plumbing (especially leaks in the same) should all be examined carefully. The population of a house, number of families living in it, number in each family, number above five years of age, and the number of rooms to each family, are very important data. This group of papers was then submitted to discussion, which was participated in by Dr. Hunt of New Jersey, Mr. Brooks of New York, Dr. Read of Ohio, Dr. Fee of Kansas City, Dr. Bell of New York, Dr. Raymond of Brooklyn, Dr. Briggs of St. Louis, Dr. G. Devron of New Orleans, Dr. Bryce of Toronto, and Dr. Cooke of Nashville, Tenn. In the main the discussion was with regard to the details of sanitary work. Mr. Brooks, however, introduced the question of the licensing of plumbers. He said in the State of New York the Legislature adopted a bill three or four years ago compelling plumbers to hold licenses. The bill when introduced was strenuously op-

posed by the plumbers, but now that it had been in force a few years the plumbers themselves were in favor of it, as they held that it kept incompetent men out of the business. Mr. Brooks urged that it was as important that plumbers should hold licenses as to their competency as it was that doctors should hold diplomas.

Dr. Briggs, in alluding to the sanitary condition of St. Louis, which had been incidentally remarked on by one of the speakers, said there was a great difference between St. Louis of 1884 and St. Louis of 1849. The sanitary condition of St. Louis at the present time was as good as that of almost any other city in the country. He would not like to say anything calculated to stop local sanitary work, but he claimed that St. Louis had as many sanitary advantages as any other American city.

Next followed a paper on the "Hygiene of Occupations," by G. H. Rohe, M.D., Professor of Hygiene, College of Physicians and Surgeons, Baltimore, which was a compilation from various sources, showing the average age at death of the followers of various pursuits.

Dr. Adolph Alt, of St. Louis, Editor of the *Journal of Ophthalmology*, read a paper on "Protective Spectacles for Workingmen," in which he showed the danger of some occupations to the eyes, and how they should be protected by mica spectacles.

Dr. Charles Curtman of Missouri Medical College read a paper on "Warming and Ventilation." He considered the philosophy of heating and ventilation and then proceeded to mention the various modes in general use. Hearths, stoves, steam pipes, water pipes, hot air, porcelain ovens and other devices were all thoroughly examined with relation to their economic and sanitary value. The defects in each were alluded to with the best way to remedy them, and the hot air method was selected by the reader as being of the most utility.

A paper on "The Sanitary Management of Cars and Stations," by Acting Assistant Surgeon W. Thornton Parker, U.S.A., Fort Union, N. M., was read by Dr. Conn. It treated on the dangers of the present system of passenger traffic on all railroads whereby healthy persons were brought into close contact with people suffering or just recovering from contagious dis-

eases, often of the most virulent type. The panacea suggested for this danger was a system of sanitation on all large railroads and the general introduction of hospital cars.

This group of papers was then briefly discussed by several members, and the Session adjourned.

The Evening Session was presided over by George W. Parker, Esq., President of the City Council, who after a few words of welcome introduced Mayor EWING, who said:

"There can be no topic for consideration more important to humanity than that of health, and the sanitary measures to be adopted and prosecuted for its preservation. These topics have become an important factor in the discussions and reports of the sanitary organizations of the civilized world. Not only have cities and States of the Union regularly constituted bodies for sanitary conference and work, but the Federal Government lends the power of its influence and material aid, as well as the experience and personal co-operation of the sanitary scientists connected therewith, for the furtherance of the purposes to be attained. Thus through intelligent conferences, and an exchange of positive experience, a general knowledge may be acquired, and definite plans for a general sanitary system may be consummated.

"This national Association, in their praiseworthy efforts to fulfil their mission and perfect the details so important to the proper conduct of their labors, exerts an influence which is felt throughout the country, and the proceedings of this annual convention will be carefully considered by all who have a proper appreciation of the great importance of the matter committed to your charge. The people of St. Louis welcome you, and I am gratified to have been commissioned by the committee in thus expressing to you the kindly feelings with which they will receive you, and every endeavor will be made to render your stay in our city a pleasure, as well as a season of the interchange of profitable experiences."

GOV. CRITTENDEN'S ADDRESS.

Mr. Parker then introduced to the Convention Gov. Crittenden. The Governor said it afforded him great pleasure, representing the people of this great State, to welcome their delegates to Missouri. Representing the people of this State he bade them welcome. He spoke of the importance of the labors of the convention to the people of the State. They were not restricted by any ethics. He did not want to reflect on many reputable physicians who were bound by ethics, but the scientists' society had broader views than any school of ethics. Any saw-bone might amputate a limb, and they never missed an

opportunity. This society, however, discussed higher questions. They discussed matters regarding the public health. Many poor people lived in illy-ventilated rooms, and these people and their children were entitled to the best efforts of the people to care for their health. What means should be adopted in order to have immunity from infectious diseases? Should Asiatic cholera visit this country next season, as is feared, the importance of the scientists' discussions could not be overestimated. In times of peace prepare for war. He then spoke of the brave act of King Humbert of Italy in cholera times in the plague-stricken city of Naples when he buried the dead, comforted the dying and exhorted the fugitives to return to their homes and their people. His example and remarks had the effect of making the people return and give battle to the dread disease. The speaker said that while they might not be able to prevent cholera or any other disease, they could divest it of many of its dreads. He was sure that when he bade the delegates welcome he voiced the feelings of everybody on this earth. Two humanitarian conventions were now in session in this city, the one to discuss means of preventing disease and the other to discuss methods of preventing crimes and vices. How glorious it was to have two such conventions running at one time in one city! The investigations of the great men of these people became common property. Men who made discoveries in this way and gave them to the world were greater heroes than Napoleon and such men. The convention came to them as the Good Samaritan, instructing them so that they could avoid their dangers. A few years ago, when a scourge was sweeping over the country their efforts had arrested its progress. A dreaded scourge was now visiting the people on the other side of the water, but their coadjutors over there were no less active in their efforts to prevent the spread of this terrible disease. Some years ago when the South was afflicted a young doctor of this city gave up his life in his efforts to save the people of that section from the dreaded scourge. The Governor closed by again bidding the delegates a warm welcome to the State.

PAPER OF DR. ELIOT.

Mr. Parker said he regretted to announce that Dr. Eliot, who was down to address the meeting, was too ill to be present himself, but the doctor had sent his son to read the paper he was to have delivered. Young Mr. Eliot said his father had intended up to a few hours previous to be present, notwithstanding the poor condition of his health, but at the last moment had decided not to, and sent him there to read the address. The speaker then read the address. In it Dr. Eliot

expressed his sympathies with the labors of the Association. The work of the convention was of the greatest importance. Cleanliness was next to godliness. In the illy-ventilated houses of the poor sobriety soon gave way to drunkenness. Perhaps no city in the Union had experienced more good from improved sanitary regulations than St. Louis. As he remembered it in 1820, there was hardly a dry cellar in the city. It was no wonder then that Asiatic cholera took a firm hold here in 1849. The death list ran up to 1,200 in a single week during the scourge, and this in a population of only 50,000. The dying were cared for and the dead properly buried. A fire broke out and it was thought it might relieve the city of the scourge, but it only made matters worse. The city in all its suffering asked no help from abroad, but bore its own burden. The death-rate in the early days of the city was very great, but improved sewerage and sanitary measures had made it what it now was, one of the healthiest cities in the world. There was room for improvement, of course, and he hoped the improvements would be made.

REMARKS OF DR. GREGORY.

Dr. Elisha H. Gregory, President of the State Board of Health of Missouri, was introduced, and after a few humorous remarks on the length of his title on the programme, he said:

"GENTLEMEN OF THE AMERICAN PUBLIC HEALTH ASSOCIATION — As a representative member of the Missouri State Board of Health, it is my proud privilege to tender you the hospitalites of our State and city. Every movement having for its object sanitation, is important to all mankind. Standing in the front rank in this regard is a knowledge of the causes of disease. I never contemplate disease causation without a sense of humility; the reflection alone comforts me that the difficulties of the subject are simply insuperable. Certainly the greatest minds and the most indomitable industry have been expended upon it with the most unsatisfactory results. Until the causes are known prevention is out of the question. 'Prevention' is the highest ideal of the sanitarian. This is the lofty purpose of your organization. Therefore we welcome you not as philanthropists of ordinary pretensions, but as votaries whose aim is so exalted that the object proposed cannot be accomplished till all the possibilities of science have been attained. Again, with the assurance of a hearty welcome, coupled with the hope that the deliberations of the meeting may be equal to your most sanguine expectations, God speed the good work."

PRESIDENT GIHON'S ADDRESS.

Dr. Albert L. Gihon then delivered the opening address, taking for his subject, "The Sanitary Responsibilities of the Citizen." He said by way of introduction that the child being father to the man it was natural that there should be many of childhood's traits manifested by its whiskered offspring. As the ordinary juvenile regarded his teacher as the arch-enemy of his independence, comfort, and pleasure, his adult descendant likewise instinctively rebelled when he was told what he must not do. With the invalid's chuckle of satisfaction when he threw the physician's potion out of the window as soon as the latter's back was turned, he defiantly determined to do the one and not the other. Conscious, therefore, of the doubtful welcome awaiting any one who performed such ungracious offices, the speaker felt some difficulty in assuming the task of introducing the body of sanitary teachers he had the honor to represent, to a community to whom they were as yet strangers. To make the prospective dose still more unpalatable it was offered to the assemblage, he said, in the form of a presidential address.

After alluding pleasantly to the nature of the task before him, the President said that the past year had made sad havoc in the ranks of the Association. Five members of the Advisory Council were among the dead: Elisha Harris of New York, a founder of the Association and former President; Charles W. Chamberlain of Hartford, Conn., Secretary of the State Board of Health of Connecticut; Robert J. Farquharson of Des Moines, formerly an officer of the medical corps of the United States Navy, and since Secretary of the State Board of Health of Iowa; John Taylor Gilman, M.D., of Portland, Me.; and Dr. Hillary Ryan of Texas. Fallen with them on the field of duty were Brig.-Gen. John M. Cuyler of the medical corps of the United States Army; Professor Willard Parker of New York; Professor Samuel D. Gross of Philadelphia, and Dr. Frederick D. Lent of New York, who joined the Association in 1874; Dr. Warren Stone of New Orleans, a member since 1880, and two of the latest recruits, John J. Holbrook, C.E., of New Hampshire, and William F. Sheehan, M.D., Health Officer of Rochester, N. Y. One other name was added to the list of honorable dead, that of Lieut.-Col. Joseph Janvier Woodward, surgeon in the United States Army, one of the original members of the Association, until the darkness that enshrouded his mental powers shut him out from the living issues of the world in which he had done so active and so meritorious a part.

After paying tribute to the memory of the deceased and speaking of the work of the sanitarian, the President said the

Public Health Association denounced intemperance in every form and counselled temperance in all things. It showed how crime was begotten by sin, sin by disease, disease by filth and filth by ignorance, but it did not seek to dispel ignorance, remove filth, overcome sin and punish crime by manacling the thinking man with irons and binding him with thongs that cut into the flesh and deprived him of freedom to act. The health of the community was only the health of individual members, and health was only that condition of well-being, well-feeling and well-doing of each man, woman and child which enabled him or her to enjoy pleasure and communicate it to others—to be happy and make others happy. The President spoke eloquently of the human form divine, and the necessity of its proper care and cultivating, developing, improving and beautifying it. The first step towards the improvement of the public health was the physical purification of the individual. The Association came to St. Louis in the hope of awakening in its citizens that interest in their own welfare which they had no right to disregard. He called attention to the comparative mortality of various nations, and spoke at length of the necessity of proper drainage and ventilation and care in removing filth from about residences. The adulteration of food was touched upon and some interesting facts given regarding tainted and diseased meats. The "farce of street-cleaning" was alluded to as a most productive cause of disease.

The means of improving the health of those who lived in cities, the President said, was simple. They should organize, and by concerted, systematic work much good could be accomplished. He had no special plan of organization to suggest—there were many roads to Rome; one should be chosen and all should travel together; in time the shortest and safest road would commend itself. The organization of the first state board of health was alluded to and the increase in the number of boards, as well as their effective efforts, was described. He spoke at length of the methods that should be adopted by the state boards to secure good results, and followed with a résumé of the cause of epidemics in the past ten years. This portion of the address was particularly interesting; in fact, the address throughout was filled with most valuable information regarding sanitary measures and the methods of preventing the spread of disease, and we hope ere long to make room for it entire. In conclusion he said: "Nature is wasteful, germs of all living things are born in needless profusion and finished unnumbered with the forest leaves, and the myriad swarms of the microscopic world. Only the fittest ultimately survive, and it should be our aim not merely to add a span to each poor puny life, but to make the strong stronger till the

evolution of the race into the highest order of which humanity is capable shall have been accomplished. Every human being cannot be made to live three score years and ten; some are doomed from birth to prematurely die and we cannot save them, but we can and ought to save those that have a right to live who are now slaughtered in hecatombs by preventable diseases.

The evening's exercises closed with a march by the orchestra.

Abstract of proceedings will be continued in next number. Several other papers besides those in this number will be published in full.

STATE BOARDS OF HEALTH REPORTS.

ILLINOIS.—The Fifth Annual Report of the State Board of Health, for 1882, is a substantial octavo volume of nearly seven hundred pages, giving an abstract of the proceedings of the Board throughout the year; a Compilation of the Medical Laws and Institutions in the United States and Çanada; Medical Education and the Regulation of the Practice of Medicine; Duration of Lecture Terms; List of Colleges which Confer Degrees; Geographical Distribution of Physicians and Students; Report in detail on the Immigrant Introduction of Small-pox, and the measures taken by the National Board of Health in conjunction with the State Board of Health of Illinois, and other State Boards, for its control; Proceedings of the Sanitary Council of the Mississippi Valley, in relation with the National Board and in regard to the River Inspection Service, the Louisiana State Board of Health, and the "New Quarantine System:" all of which has been noticed *pari passu* in THE SANITARIAN for the time.

The Immigrant Inspection Service, however, presents some important facts in detail with reference to the habitual carelessness of some of the steamship companies, which deserve the greatest publicity, illustrating the necessity of such amendments to the Emigration laws as will compel more stringent regulations for the prevention of small-pox and *other* diseases, —for it is a notable feature that the highest rate of mortality obtained in those ships which through parsimony or neglect fail to provide competent medical and sanitary officers.

"Taking those vessels the figures of which are large enough to generalize from, it is found that the proportion of unprotected, or imperfectly protected immigrants landed in this country from given steamers, varies from less than 5 per cent., as in the case of the 'America,' of the *German Lloyd Line*, to over 54 per cent., as in the case of the 'Island,' of the *Thingvalla Line*. As between vessels of the same line, there is also seen the same disparity—the 'America' above cited, and the 'Donau,' both of the *North German Lloyd*, the former less than 5 per cent., the latter over 30 per cent. of unprotected."

And here follow comments by the Assistant Inspectors on the degree of attention paid to the prevention of the introduction of small-pox.—Notably:

The *Allan Line* appears to have given no attention to the subject. From four ships of this line: "Parisian," "Sarmatian," "Polynesian," and "Sardinian," 528 immigrants were received, who were either entirely unprotected or imperfectly protected against small-pox.

The *American Line* was equally negligent with the Allan line. So far as could be learned, on board the "Ohio," "Lord Clive," "Pennsylvania," "British Crown," "Amsterdam," and "Netherland," there were no vaccinations of adults. And on board the "Pieter de Cormack," of the *White Cross Line*, 30 per cent. of all the vaccinations were failures.

The volume concludes with sixty pages devoted to mortality statistics, and a summary of the deaths in Illinois, from the census returns for 1880; by which it appears that the ratio of deaths per 1,000 of population in Illinois is .46 less than in the United States at large: Illinois, 14.63; United States, 15.09.

KENTUCKY.—The fourth semi-annual meeting of the Kentucky State Sanitary Council was held at Elizabethtown, October 12th, with a large attendance from the locality and from various portions of the State. Hon. T. A. Robertson, M.C., delivered an address of welcome, in the course of which he paid a high tribute to unselfish laborers working in the interest of health reform in this and other States and countries, and said that it was at once the most practical and in its results the grandest subject which could engage the attention of the states-

man. The President, Mr. George Baber, editor of the *Louisville Sunday Argus*, was then introduced and delivered an address setting forth the origin, objects, and methods of the Council, and the important results which had already been secured through it and similar influences in Kentucky. He was before them as a layman, to say a few words from the standpoint of a layman in reference to this movement, which should interest every citizen because it concerned the health of every citizen's family circle. He spoke of the progress it had already made in the State; and this too without the invigorating effects of great influences, without even the concerted action of the medical profession. People who ten years ago had never heard of sanitary regulations, are now beginning to be familiar with some of the even less important rules to be observed in order to maintain health. Although at first ridiculed, the movement has gained the respect and attention of our intelligent people, and is destined to grow with the years.

Dr. Dudley S. Reynolds, of Louisville, was the next speaker and delivered an instructive address on "A Healthy Home." In a plain and forcible manner he called attention to the essential appointments of a dwelling-house, giving special attention to location, drainage, ventilation, and other points most commonly overlooked. This address elicited a spirited discussion, in the course of which Dr. McCormack said, that the State Board of Health has been engaged in making a sanitary survey of Kentucky, inquiring on a large scale into the home life and habits of the people. The result is not flattering to our vanity. Carelessness in regard to the location, construction and ventilation of our houses, and in regard to the disposal of house refuse and kitchen slops, are reported from all sides; and the result of these neglects—typhoid and scarlet fever, diphtheria and other filth diseases—are widely prevalent. He pointed out the absence of all systematic attempts at ventilation, and stated also that this survey showed that only about one-third of the people of this State had been vaccinated. Thousands of dollars were paid from the county treasuries every year to treat and stamp out small-pox, which, properly applied in vaccination, would entirely prevent the disease.

At the morning session of the second day, Dr. H. D. Rodman read a paper on the "Injurious Effects of Alcoholic Bev-

erages." Dr. P. C. Sutphin, of Caumer, read a paper on "Alcoholic Liquors in their Relation to Health Laws," in which he raised the question of the necessity of enforcing prohibition as a sanitary measure. He said it was inconsistent to insist upon sewerage as a health precaution, while the dram-shop, a more powerful factor in the destruction of the powers and energies and health and welfare of the supporting elements of the race, was allowed to stand, a monument to the cowardice or cupidity of those who claim to have at heart the welfare and health of the citizens of Kentucky. Drinkers of alcoholic stimulants are, in addition to the special dangers growing out of this habit, always the first to succumb to epidemic diseases. During the epidemic of cholera in Glasgow in 1832, only 19 per cent. of the temperate who were attacked with the disease perished, while 91 per cent. of intemperate died. Of 1,000 who died of this disease at Montreal the same year, but two were total abstainers. He said that, though it was not at present in the power of the health authorities to be effective here, they may have the power in the future admitted of but little doubt, if the evil was properly dealt with in the schools, from the pulpit and by the press.

Dr. W. R. Jones, of Princeton, read a "Narrative of an Outbreak of Small-Pox in Caldwell County," when the disease was allowed to spread until 37 cases and 3 deaths occurred before the authorities were aroused, when the disease was promptly stamped out by isolation and vaccination. Dr. J. N. McCormack read a paper on "The Location and Construction of School-houses," considering all essential health points and giving especial attention to the importance and the most approved methods of lighting, heating, and ventilation.

At the afternoon session, Dr. R. B. Pusey, of Elizabethtown, read a paper on "The Prevention of Cholera," dealing with the sanitary measures to be enforced before the advent of the disease. Dr. O. H. Posten, of Harrodsburg, read a paper on "The Preservation of the Eyesight." He was followed by Dr. J. A. Tanner, Scientist of the Polytechnic Society of Louisville, with an address on "Adulterations of Food," illustrated with practical demonstrations of the best methods of detecting adulteration of the articles of diet in most common use, carefully distinguishing between such as are only commercial frauds and those

which are dangerous to health. Papers were read by Professor J. N. Payne, of Elizabethtown, on "The best Methods of Teaching the Laws of Health in our Schools;" by Dr. C. G. Oud, of Cecilian, on "The Sanitation of Railroad Depots," and by Dr. E. Warfield, of Elizabethtown, on "Ventilation."

At the evening meeting an interesting and exhaustive paper on "The Disposal of the Dead," by Rev. Jno. D. Beugless, U.S.N., of Brooklyn, N. Y., was read. Professor L. Eddy, of the State Deaf and Dumb Institution, Danville, read a paper on "Sanitation a Religious Duty," and was followed by Dr. William Cheatham, of Louisville, with the closing address on "Short-Sightedness, its Cause and Prevention," illustrated with magic lantern exhibitions.

This was far the most interesting and successful meeting the Council has had. The proceedings will be published for popular distribution. The next meeting will be held at Bowling Green in April, 1885.

ONTARIO.—The Second Annual Report of the Provincial Board of Health of Ontario gives a very complete statement of the sanitary condition of the Province for the year 1883. It is shown that it is in the power of the legislature to save nearly three thousand lives annually by proper legislation. It is shown that the government has been very slow to enact suitable measures for the protection of life and the preservation of health, and that, looked at merely in the light of economy, millions of dollars might be saved annually. But legislatures are only the representatives of the will of the people, and cannot run too far in advance of public sentiment. It is, therefore, necessary that they be properly instructed in the necessity for sanitary reform as a means of promoting their happiness. This is equally true of other countries as of Canada.

The Report does great credit to a board so recently organized, and shows that the selection was well made. Some of the tables are very important and the inferences drawn from them are very instructive. It is undoubtedly true that we should be "desirous of information, not only about the more fatal forms of disease, but also about those which, though less fatal in their immediate effects, yet leave the body a prey to the former." Some however, may challenge the statement

that, while "there are scarcely any deaths returned as due directly to diseases of malarial origin, yet reliable statistics show that malaria is the ultimate cause of death of fifty per cent. of the human race."

Group I. shows the fact that intermittent prevailed during the whole of the unusually severe winter, rose to its October height immediately on the opening of the ground after the winter frosts; that this year puerperal shows its relationship to erysipelas, and that cerebro-spinal fever sprang up quite suddenly in April, rose and fell during April, May, June, July and August, almost regularly with erysipelas.

Group II. shows "a remarkably small increase of diarrhœal diseases up to July, when in spite, apparently, of the rains which kept fevers from rapidly increasing, diarrhœas suddenly increase to nearly three times their amount in June. What relation this increase bears to meteorological phenomena and the consequent changes occurring on and in the soil, is of extreme interest and affords much food for reflection."

The temperature for June and July was the same (64° F.) nearly, and the daily range varied not more than one degree. The humidity, the mean cloudiness, the amount of rainfall, and the number of rainy days were nearly the same. Again, the first two weeks in July gave 290 cases of diarrhœa, while the last two gave 569. Will the usual causes—debility, unripe fruit, unwholesome vegetables and the like—be sufficient to account for the difference? The Report thinks it will not.

Group III. presents the changes in zymotic diseases during the year, but it is shown that diphtheria and whooping-cough, which are usually considered zymotic *par excellence*, do not follow the same course as the group to which they belong. These diseases follow other causes than temperature.

Group IV., which includes the three eruptive fevers, scarlatina, measles and small-pox, shows a manifest tendency to follow the course of Group I. Groups V. and VI., which represent consumption and other diseases of the respiratory organs and specific diseases, cannot be stated satisfactorily in a brief summary.

Would it not be well for health reports to vary the usual course and study diseases in relation to other causes and other influences than temperature?

The fact that it is possible to limit zymotic diseases to *first* cases is strongly urged on physicians and housekeepers, and they are made responsible for the consequences, if any of the well-understood precautions for preventing their propagation are neglected.

A very severe form of chicken-pox prevailed in some places, and a careful study of cases suggested the following conclusions:

1st. That close relations exist between chicken-pox and small-pox, probably owing to the fact that the conditions favorable for the one are those serving for a free development of the other.

2d. That danger of small-pox becoming epidemic arises either from a false diagnosis of the first case, or from the selfishness of those whose business might be unfavorably affected.

3d. That isolation and disinfection, thoroughly enforced at first, are sufficient to stamp out the disease.

4th. That vaccination modifies the susceptibility to the disease, and that it greatly lessens its severity.

5th. That the mortality from the disease does not seem to be less than in former times, at least in persons who were not previously vaccinated.

Typhoid fever is classed with diphtheria as "among those zymotic diseases which are communicable from one person to another." This is a proposition that will not be accepted without question. Typhoid fever is freely received into some of our hospitals and placed in the wards with patients having other diseases, yet the writer has never known a case to have its origin in the wards.

There are many appendices accompanying the volume, and some of them deserve a much more extended notice than can be given in the present number. Among these may be mentioned the chapter on *School Hygiene*.

OVERWORK IN GERMAN SCHOOLS.—After forty-two years of experience it is now virtually conceded, in Germany, that physical exercise is not a sufficient antidote to brain-pressure, but that where the evil exists, the remedy must be sought in the removal of the cause. Official action with reference to over-pressure has been taken in Prussia, Saxony, Wurtemberg, Baden, Hesse, and Alsace-Lorraine.

The commission appointed by the Stadhalter of Alsace-Lorraine, recommended that the number of study hours should be restricted to twenty-six a week for the lowest classes of the gymnasia, and to twenty-eight to thirty-two for the higher; that the hours of home study should be eight, twelve, and eighteen a week, progressing from the lowest class to the highest; and that six hours a week should be devoted to general physical exercise, including swimming, open air sports, skating, and excursions. While the existing conditions will be somewhat ameliorated by these decrees, they do not seem to have brought about a final solution of the difficulty. Last year a petition upon the subject, signed by eminent teachers, physicians, and other citizens, was addressed to the Prussian Chamber of Deputies. After setting forth the deplorable effects of excessive strain upon the nervous system of scholars, it appealed to the patriotism of the deputies to put an end to the abuse, which, the petition asserts, "threatens, little by little, to reduce the cultivated classes of society to a state of moral weakness that shall render them incapable of great and manly resolution."

VACCINATION DANGERS.—During a recent discussion by a company of Hibernians on the subject of vaccination, when its opponents and supporters had fairly exhausted their arguments, one of the company, who had not hitherto spoken, volunteered his opinion that, far from being a benefit to the human race, the precaution was both dangerous and unnecessary. "I will give you a proof," he said. "The son of a friend of mine, as healthy a little fellow as you would wish to see, was vaccinated by an idiotic medical man who attended the family, and what was the consequence? He died two days after the operation had been performed!" . . Here the speaker paused for a moment, evidently gratified by the impression he had made on his hearers. "Yes, gentlemen," he continued, "the poor lad, who was as active as a squirrel, was in the act of climbing a tree, when, a branch giving way, he lost his hold and was killed by the fall. Don't talk to me of vaccination after that."

MORTALITY STATISTICS IN THE UNITED STATES.

FIVE WEEKS, ENDING AUGUST 30, 1884. Correspondents under this head will please send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Fever.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
†Burlington, Vt., 12,500	44	27	3	1	..	..	..	2	..	12	42.2
Boston, Mass., 427,940	1 070	518	158	21	15	1	..	31	..	289	25.9
*Lowell, Mass., 68,500	132	70	4	3	3	..	51	2	..	..	25.0
*Lynn, Mass., 38,284	77	36	14	2	..	..	1	1	..	21	25.9
Somerville, Mass., 28,663	...	...	..	..	..	..	..	..	..	..	....
Worcester, Mass., 58,295	149	61	17	6	..	..	2	..	..	47	23 8
†Providence, R. I., 120,000	225	124	32	2	2	1	7	9	..	60	22.5
†New Haven, Ct., 75,000	134	61	18	2	2	..	1	10	..	59	21.4
New York, N. Y., 1,356,958	3,538	1,865	727	117	27	69	68	91	..	827	27.1
Brooklyn, N. Y., 624,118	1,523	854	258	35	9	10	47	31	..	474	24.4
†Rochester, N. Y., 105,000	204	110	30	3	..	1	4	4	..	54	20.9
Albany, N. Y., 97,344	201	75	40	2	..	..	6	5	..	31	21.4
†Auburn, N. Y., 25,000	52	28	8	..	..	..	..	2	..	16	24.9
Yonkers, N. Y., 21,000	34	24	5	..	1	..	1	1	..	12	16.0
*West Troy, N. Y., 13,000	18	7	3	1	..	..	..	..	..	6	18.0
Hudson Co., N. J., 209,000	463	229	74	13	7	1	4	5	1	78	23.0
†Paterson, N. J., 57,000	118	68	8	1	2	..	1	3	..	22	24.8
§Philadelphia, Pa., 927,995	1,141	508	163	40	13	2	20	42	2	136	21.7
Pittsburg, Pa., 180,000	425	251	51	40	5	9	13	11	..	136	24.6
Erie, Pa., 36,768	64	41	3	..	1	..	..	..	..	31	29.8
Wilmington, Del., 51,500	136	65	22	3	2	..	1	6	..	28	34.2
Cincinnati, O., 280,000	509	212	74	8	5	1	4	18	..	82	18.9
Cleveland, O., 200,429	437	292	45	10	..	13	6	8	..	154	22.7
Toledo, O., 52,000	..	..	..	..	..	..	..	..	..	..	....
†Detroit, Mich., 140,000	337	115	27	23	2	3	3	21	..	94	28.3
*Evansville, Ind., 40,000	73	36	11	..	..	..	1	11	..	8	23.7
Rock Island, Ill., 11,650	25	15	3	2	1	..	3	1	..	7	27.7
†Chicago, Ill., 630,000	1,224	755	131	47	14	48	11	59	..	345	21.7
†St. Louis, Mo., 400,000	717	328	100	17	12	5	4	62	..	124	21.5
†Milwaukee, Wis., 150,000	379	160	28	2	6	4	8	8	..	139	33.3
Omaha, Neb., 50,000	...	..	..	..	..	..	..	..	..	..	....
Salt Lake City, Utah, 25,000	66	32	1	2	..	..	..	2	..	25	38.9
†San Francisco, Cal., 235,000	369	125	63	16	..	..	..	9	..	21	18.8
†Minneapolis, Minn., 100,000	210	136	21	15	..	3	3	14	..	57	25.2
†St. Paul, Minn., 100,000	177	125	8	11	..	1	3	10	..	36	21.2
Baltimore, Md., 408,520	764	366	110	40	7	..	18	44	..	99	19.4
†Dist. of Columbia, 145,010	444	229	6	63	7	..	9	19	..	85	22.4
†Richmond, Va., 73,400	164	65	21	..	..	..	..	22	..	20	26.8
Lynchburg, Va., 23,000	31	14	..	..	1	..	2	3	..	2	17.5
New Orleans, La., 234,000	567	181	106	5	2	1	4	53	3	48	25.1
†Nashville, Tenn., 50,000	114	45	19	11	..	..	2	5	..	21	27.3
†Mobile, Ala., 31,295	79	25	9	..	..	..	..	17	..	4	30.6
Grand Rapids, Mich., 42,000	...	..	..	..	..	..	..	..	..	..	....
†Lansing, Mich., 9,784	15	7	1	..	..	..	..	..	..	8	17.9

* 4 weeks; § 3 weeks; † Month of August.

MORTALITY STATISTICS ABROAD.

FOUR WEEKS, ENDING JULY 26, 1884.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Typhoid and Typhus Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,019,361.....	7,359	2,949	636	109	117	167	276	95	91	1,514	24.1
Liverpool, 573,202.....	1,151	382	...	7	10	85	56	18	11	142	26.1
Glasgow, 517,941.....	1,029	359	159	14	24	17	61	14	..	72	25.6
Birmingham, 421,258...	605	170	...	1	9	40	38	3	..	54	18.7
Dublin, 351,014.....	568	95	49	7	23	...	14	13	..	15	22.3
Manchester, 338,296....	633	174	...	3	17	5	12	4	..	59	24.4
Leeds, 327,324.....	615	325	....	3	18	17	9	3	..	110	24.5
Sheffield, 300,563.....	548	191	...	1	41	...	5	6	5	57	23.7
Edinburgh, 246,703....	328	76	41	7	2	3	18	4	..	18	17.5
Belfast, 216,622.....	336	58	63	..	4	...	8	1	..	9	20.1
Bristol, 215,457.....	240	60	...	3	..	...	5	1	..	16	14.7
Bradford, 209,564.....	300	71	...	..	3	21	3	1	..	23	18.6
Hull, 181,225.....	256	78	...	..	1	4	8	2	3	21	18.4
New Castle, 151,325....	273	83	...	..	6	2	4	..	..	34	23.5
†Havre, 105,867.....	151	61	11	3	1	...	1	2	..	43	36.0
Reims, 93,823.....	240	116	20	5	5	...	...	3	..	107	34.4
Nancy, 74,954.....	128	43	10	2	..	...	...	1	..	34	22.2
Breslau, 290,000.....	1,001	527	99	15	1	26	2	10	..	216	44.8
Brussels, 171,293.....	330	114	44	5	1	1	...	7	10	74	25.8
Cologne, 150,513.....	453	260	25	2	..	...	7	2	..	139	39.1
Christiana, 122,000.....	190	62	14	6	1	...	9	..	..	31	19.7
FOUR WEEKS, ENDING July 19, 1884.											
Frankfort, 145,100.....	297	89	30	4	2	2	8	1	..	47	24.6
Hanover, 131,200.....	225	80	16	3	1	3	3	3	..	23	22.2
Bremen, 119,561.....	196	69	15	5	10	...	1	1	..	14	21.3
Dantzic, 116,162.....	234	92	8	1	7	...	4	3	..	45	26.0
Stuttgart, 109,937.....	208	84	15	6	..	7	3	1	..	32	24.5
Strassburg, 110,739....	246	121	17	1	..	2	1	1	..	88	28.8
Dusseldorf, 105,287....	221	128	9	4	..	4	2	4	..	68	27.1
Nuremburg, 105,176....	252	109	31	4	3	1	6	3	..	62	31.1
Chemnitz, 102,713.....	356	226	9	11	1	...	1	..	..	10	44.8
Magdeburg, 105,000....	258	125	14	6	3	...	6	1	..	55	31.9
Elberfeld, 101,000.....	207	76	21	4	6	3	...	3	..	22	25.8
*Barmen, 100,000.....	141	46	8	8	2	3	1	1	..	23	24.4
Altona, 97,000.....	196	75	23	1	4	...	1	1	..	31	26.2
*Aix-la-Chapelle, 89,116	223	110	23	1	..	5	9	2	..	57	43.2
Mayence, 64,120.....	133	46	10	..	4	...	...	1	..	23	26.9
Amsterdam, 350,202....	846	...	...	45	27	25	6	7	..	34	30.4
Rotterdam, 166,001....	336	...	...	7	1	32	2	1	..	19	27.0
The Hague, 131,417....	285	...	...	8	1	24	...	2	..	6	28.2
Lyons, 376,613.....	752	87	86	6	..	13	3	5	16	128	25.2
Berlin, 1,225,065.....	3,341	1,927	146	148	23	18	63	17	1	1,082	35.4
Hamburg, 486,678.....	1,083	409	89	29	4	12	14	5	..	156	28.7
Dresden, 236,000.....	585	258	44	22	7	7	13	3	1	63	32.2
Munich, 240,000.....	628	279	56	8	1	1	9	4	..	129	34.0
Leipzig, 164,636.....	365	180	22	19	2	1	5	1	1	76	28.8
Kœnigsburg, 154,000...	405	196	21	13	10	...	...	5	..	91	34.1
*Bucharest, 200,000. ..	342	117	35	5	6	10	1	9	..	65	29.2
Paris, 2,239,928.....	4,353	926	287	110	18	125	48	148	4	700	29.9
‖Calcutta, 433,219.....	875	...	...	..	..	..	...	211	86	174‡	27.6

* 3 weeks; † 2 weeks; ‡ Cholera; ‖ 4 weeks, ending June 14th.

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH ENDING AUGUST 31, 1884.

Arrival.	Vessels.	From.	Passengers.	Deaths.	Births.
Aug. 1,	Republic,	Liverpool,	362		1
" 2,	Fulda,	Bremen,	600	1	
" 5,	Anchoria,	Glasgow,	223		1
" 5,	Rugia,	Hamburg,	801	2	
" 6,	Martha,	Stettin,	58	1	
" 7,	Rhynland,	Antwerp,	421	1	
" 8,	Celtic,	Liverpool,	492	1	
" 10,	Island,	Copenhagen,	257	1	
" 13,	Rhein,	Bremen,	617		1
" 13,	Canada,	Havre,	338	1	
" 19,	Moravia,	Hamburg,	410		1
" 21,	Donau,	Bremen,	753	1	
" 22,	Geiser,	Copenhagen,	296	1	
" 23,	Werra,	Bremen,	867	1	
" 23,	Egypt,	Liverpool,	593	1	
" 24,	Gellert,	Hamburg,	636	1	
" 24,	Oregon,	Liverpool,	976		1
" 27,	Bohemia,	Hamburg,	398		1
" 27,	St. Laurent,	Havre,	276	1	
" 30,	Westphalia,	Hamburg,	597		2
" 31,	Australia,	"	358		1
" 31,	Italy,	London,	337	1	
			10,666	15	9

STATISTICS OF THE BRITISH EMPIRE.

THE area of the British Empire is eight and a half million square miles. Including countries politically under its control, such as Egypt, Zululand, and Afghanistan, the total amounts to ten million square miles, or one-fifth of the habitable globe. One-quarter of this area has been topographically surveyed. The total coast-line is 28,500 miles, with 48 large harbors. Only one-fifth of the area is cultivated or occupied. There is

room enough in Canada and Australia to support a population of 200,000,000. The total population of the empire amounts to 315,000,000, of which 39,000,000 are Anglo-Saxons and 188,000,000 are Hindoos. The annual revenue amounts to £203,000,000, of which sum £89,000,000 comes from the United Kingdom, £74,000,000 from India, and £40,000,000 from the colonies and dependencies. Only one-fourth of the total revenue is derived from land taxation. Including local taxation the revenue is £264,000,000, and amounts to £1 5s. 4d. per head per annum. The number of men trained to arms amounts to 850,000, about 700,000 of these being of the fair or dominant race. The defensive armaments by sea and land cost £41,000,000 annually, which is less than that shown by any great State in the world except the United States. There are 560,000 policemen in the empire, 1 to every 571 inhabitants and to every 16 square miles. There are 246 war vessels and 30,000 merchant ships, manned by 270,000 sailors. The factory steam power in the world is represented by 7,500,000 horse-power; of that total 2,250,000, or about 30 per cent., is British. If the main elements of national industry be taken together—namely, commerce, manufactures, mining, agriculture, carrying trade, and banking—the total, £2,000,000,000 and upward annually, is about the same for the United Kingdom and the United States. But the United States are advancing the fastest, and are already passing ahead. There are 675,000 persons convicted annually of crime in the empire, of which number more than nineteen-twentieths pertain to India. The number of paupers in the United Kingdom under relief amounts to 1,000,000, or rather less than one-thirtieth of the population, and the cost of their maintenance is £10,000,000 annually. In regard to the postoffice, the letters posted annually in the world are 5,200,000,000; of this total 1,500,000,000, or 34 per cent., are in the British Empire. Respecting education, there are 5,250,000 pupils at schools in the United Kingdom, 860,000 in Canada, 611,000 in Australia, and 2,200,000 in India, making a total of 8,921,000 pupils in the British Empire.—SIR RICHARD TEMPLE, Bart., before the British Association for the Advancement of Science, at Montreal, August 28, 1884.

OBITUARY.

ROBERT JAMES FARQUHARSON, M.D., was born at Nashville, Tenn., July 16, 1824. He was the son of a Scotch Highlander, who with others joined Prince Charles in a reformatory movement, and on the failure of the Prince, came to America and settled at Nashville, where he lived fifty years, and became a successful merchant. Robert received his early education at Nashville University, from which he graduated at the age of 17, when he entered Pennsylvania Medical University, at Philadelphia, graduating at the age of 20. As, by the rules of that institution, he could not receive his diploma until he had attained his majority, he spent the interim as resident physician of Pennsylvania Hospital (Blockley), to which position he was unanimously elected on a recommendation signed by every professor of the Medical University. He served in the hospital one year, when receiving his diploma, he went to New Orleans, where he served in a hospital two years, and returned to Nashville. April 20, 1847, he was appointed by the President, Assistant Surgeon in the United States Navy, and immediately entered upon his duties. He remained in this service ten years, and was for most of the time on active service. He was promoted to Passed Assistant Surgeon in 1852. In 1855, he resigned from the Navy, and not long after married Lydia Smith, granddaughter of James Robertson, the founder of Nashville, and began the practice of his profession in that city. When the war of the Rebellion came, he was one of the few of Tennessee who were true to the flag under which he sailed for a decade. When Morgan made his raid, "that Union doctor" was a special object of search. His buildings and property were destroyed. He fled, and secreting himself in a corn-field for ten days, eluded pursuit, and finally escaped to Cincinnati. When safety was assured he returned to Nashville, and when the "Andy Johnson" regiment was raised, he was commissioned surgeon thereof. In August, 1864, he was appointed Assistant Surgeon of the U. S. Military Railroad Hospital, at Nashville, which position he held until the close of hostilities. In 1869 he removed to Davenport, Iowa, where he remained until May, 1881, when

he was elected Secretary of the State Board of Health of Iowa, and removed to Des Moines.

Dr. Farquharson inherited the sterling integrity of his ancestors, love of country, friends, and home. He was remarkably unassuming, and never forced himself upon the attention of others, yet he was fond of society—not folly; and at all times and in all places, was entertaining. He was a thorough student of science, and familiar with many authors. He has written many papers upon scientific subjects, which have received the endorsement and acceptance of prominent scientific associations at home and abroad. He was a member of the American Association for the Advancement of Science; the British Association for the Advancement of Science; the American Antiquarian Society; the Anthropological Society of Washington; the Institution Ethnographique of Paris; the Davenport Academy of Science (being one of its founders); the American Public Health Association; the Sanitary Council of the Mississippi Valley; the Iowa State Medical Society, and Polk County Medical Society. At the last meeting of the State Medical Society he presented a paper upon "The Typhoid Fever of America," in which he showed the distinction between that disease and the typhoid fever of India, and expressed the firm conviction that there was no true typhoid fever in America. As Secretary of the State Board of Health, he gave the people wise and safe counsel, as the result of a profound knowledge of sanitary science.

His last literary labor was the short contribution which follows:

BACILLI TUBERCULOSIS A HUNDRED YEARS AGO.

DES MOINES, IOWA, August 11, 1884.

EDITOR OF SANITARIAN: Lately a paper on "Leprousy," published in Upsaliae (Sweden) in 1763, has come into my hands, and there is to be found the following, which is pleasant reading in these days, when we hear so much about the contagiousness of consumption and of its bacillus.

The author, Isaac Udmann, in speaking of the cause of leprosy, mentions itch as undoubtedly the product of *acaris:*

"Jam vero nemini non constat, oriri illam non nisi ab, *Acaris*, sub cute nidulantibus," etc.

Then he mentions other diseases as of animalcular origin:

"Vix aliud quidquam concludere possumus, quam quod febrium istarum cuilibet, *e.g.*, Pesti, Variolis, Morbillis, Syphilitidi, etc., sua sint *animalcula propria* subtilitatis propemoum infinitæ."

"Haud ignoro equidam, etiam *Phthisin* subinde contagiose propogari; ubi tamen nulla unquam de animalculis ejusmodi obtinuit suspicio. Est quidem scilicet, ubi oritur Phthisis vel ex ipsa structura coporis, vel ex contusionibus, hæmoptysi, etc. Sed nec desunt occasiones aliæ, ubi vel valentissimis ingruit malum hoc, sine caussa omni prævia, saltim nequaquam perspecta."

But with many, confidence in our author will be shaken by the following quotation, recalling a name familiar to youth:

"Hic dum pulvis aqua micetur, videre licet animalcula tantum non innumera subtilissima, quæ sponte se moveant, prout clarissime hoc indicavit *Illustr. Baro. a Munchhausen*, in libro qui Hausvater inscribitur p. 149. Sed haec in transcurfu."

Yours truly,

R. J. FARQUHARSON.

LISTERINE.—As a deodorant and antiseptic for the sick-room and dentist's office, Listerine stands pre-eminent. While it is equal to any and superior to most of the agents commonly used under such circumstances, it adds an agreeable aroma instead of an offensive odor to the surroundings; and is particularly well adapted to the lying-in room. It may be freely used in spray or lotion without stain or irritation as an agreeable and effectual detergent. It is also specially commendable in weak solution, as a mouth wash and gargle for aphthous sores or a fungous condition of the gums, and bad breath; and for certain forms of indigestion—those accompanied by disagreeable eructations—a few drops of Listerine in water swallowed is a particularly grateful and excellent remedy. Moreover, according to a series of "Experiments upon the Strength of Antiseptics" by Dr. A. T. Cabot (Boston *Medical and Surgical Journal*, Nov. 27, 1879), Listerine compares favorably with the most reliable agents for the rapid destruction of micro-organisms.

LITERARY NOTICES.

OUR HOMES AND HOW TO MAKE THEM HEALTHY. By R. Brundell Carter, F.R.C.S.; F. S. B. F. De Chaumont, M.D., F.R.S.; W. H. Corfield, M.A., M.D. (Oxon.); William Eassie, C.E., F.L.S.; F.G.S.; Robert W. Edis, B.A., M., Inst. C.E.; Douglas Galton, C.B., D.C.L., F.R.S.; Thomas Eccleston Gibb; Malcom A. Morris, F.R.C.S. Ed.; Shirley Forster Murphy, M.R.C.S.; J. Wallace Peggs, C.E.; B. W. Richardson, M.D., LL.D., F.R.S.; Percival Gordon Smith, F.R.I.B.A.; William Squire, M.D.; Keith Downs Young, A.R.I.B.A.; Philip Brown. Edited by Shirley Forster Murphy, Medical Officer of Health to the Parish of St. Pancras; Hon. Secretary to the Epidemiological Society, and to the Society of Medical Officers of Health. 8vo, pp. 959. With numerous Illustrations. Cassell & Co., London, Paris, and New York.

This is an unusual comprehensive and useful work. The names of the authors, as here enumerated, will at once commend it to all sanitarians, as they are without exception well known to be among the foremost contributors to the promotion of health. The Introduction consists of a chapter of 32 pages on Health in the Home, by Dr. B. W. Richardson, which deals with communicable diseases, pulmonary consumption, neuralgic and miasmatic diseases; colds, chills and irritations; enfeeblements from deficient light and impure air; accidents from poisons, and principles of domestic sanitation. Architecture, by Percival Gordon Smith and Keith Downes Young, occupies 265 pages and treats of the healthful conditions of buildings suited to all classes and uses. Robert W. Edis and Malcom Morris devote upwards of one hundred pages to Internal Decoration—excluding all dangerous and unsanitary ornamentation and fixtures—and particularly dwelling upon substitutes for laid-down carpets, arsenical wall-papers and dust-collecting materials. Lighting, by Robert Brundell Carter, takes up a hundred pages on the nature and salutary effects of well-adjusted light, and the ill effects of insufficient, badly arranged, and air-contaminating lights. Warming and ventilation, by Douglas Galton, is a very complete contribution of upwards

of 200 pages, on the physical properties of the air and the practical methods for maintaining its purity, under the various means of warming houses of all kinds. House Drainage, by William Eassie, Defective Drainage, by W. H. Corfield, and Disposal of Refuse by Dry Methods, by the Editor, together occupy 146 pages, and comprehend a lucid description of the best practical methods under the several headings. Water, by Professor De Chaumont, Rogers Field, and Wallace Peggs, deals with the sources, quality, and quantity of water supplies; the effects of impurities and the dissemination of diseases by impure water, collection, storage and delivery; purification, under-ground movement, construction of wells, and examples of water supply to houses—a paper, it is scarcely necessary to add—of the utmost practical importance. The Nursery, by William Squire, is a comprehensive statement of the best practical means for promoting the health of infants and children—deals with the wants of the nursery, infant physiology and hygiene, and the relations of external influences to the physical well-being of childhood. House Cleaning, by Phillis Browne, is an admirable chapter of 25 pages, of interest to every housekeeper. Sickness in the House, by the Editor, treats of the situation, size, ventilation, lighting, furniture, nursing, advantages of removal under certain conditions, and, in case of infectious diseases, the conditions and practical methods of disinfection. The concluding essay, by Thomas Eccleston Gibb, is on legal liabilities with reference to the protection and maintenance of public health under English laws—replete with suggestion for effective laws and ordinances in the United States. The work throughout is well illustrated by diagrams and cuts; and is, taken altogether, one of the most practical and useful books on sanitation hitherto published.

PRACTICAL TREATISE ON DISEASE IN CHILDREN. By Eustace Smith, M.D., Fellow of the Royal College of Physicians; Physician to his Majesty the King of the Belgians; Physician to the East London Children's Hospital, and to the Victoria Park Hospital for Diseases of the Chest. 8vo, pp. 868. $5.00. New York: William Wood & Co.

This is a work which will interest every medical practitioner, as a complete treatise by one of the best-known authorities on

the diseases of children. It is divided into *twelve* parts: 1. Acute Infectious Diseases; 2. General Disease not Infectious; 3. Diathetic Diseases; 4. Diseases of the Ductless Glands and Blood; 5. Diseases of the Nervous System; 6. Diseases of the Organs of Respiration; 7. Diseases of the Heart; 8. Diseases of the Mouth and Throat; 9. Diseases of the Digestive Organs; 10. Diseases of the Liver; 11. Diseases of the Genito-Urinary Organs; and 12. Diseases of the Skin. Throughout, the author, in addition to his own extensive practical observation, makes free use of contemporary authorities abroad, as well as in his own country, in the elucidation of all questionable subjects, but with rare powers of consolidation and terseness of statement. It should find, as it deserves, a place in every practitioner's library, for few can afford to do without it.

A TREATISE ON PHYSIOLOGY AND HYGIENE FOR EDUCATION INSTITUTIONS, AND GENERAL READERS. FULLY ILLUSTRATED. By Joseph C. Hutchison, M.D., LL.D., Ex-President of the New York Pathological Society; Ex-Vice-President of the New York Academy of Medicine; Surgeon to the Brooklyn City Hospital; late President of the Medical Society of the State of New York, etc., etc. 12mo, pp. 319. New York: Clark and Maynard.

This is a revised edition of a work which has already obtained extensive popularity as a school-book. For convenience of arrangement and scientific accuracy in all that is essential for an elementary work on physiology and hygiene in the school-room, except its partial treatment of the influence of alcoholic stimulants, it is highly commendable. The illustrations, especially, are particularly excellent as object lessons, and well calculated to make lasting impressions on the mind of the pupil. The lessons on hygiene are equally excellent, and we would that there was more of this and less of anatomy; but in this respect it compares favorably with, and is superior to, most of the school-books on the same subject. An Appendix of a dozen pages, on poisons and their antidotes, drowning, care of the sick-room, disinfection, emergencies, the home and health, and on going into the country, is an admirable summary, useful to every household.

But on the subject of stimulants it possesses the common

fault of partial treatment. Under the head of Food and Drink, the effects of "*common alcohol*" alone, the form in which it is rarely or never used, except in the arts, are considered. Its poisonous effects on plants and animals are given somewhat in detail, and the conclusion arrived at "that not only is alcohol not a food, but injurious in itself, and a detriment to the food taken. . . a poison."

Comparatively obscure writers on the subject are quoted in support of this view, to the total exclusion of distinguished physiologists, and authorities on foods; and the reader is left to infer, if he knows no better, that the effects of alcoholic liquors in the forms they are commonly used, are the same as "common alcohol." But the final conclusion is that though a poison—and shown to be, according to some of the citations, dangerous to any persons taking it, under whatever exposure and fatigue—"For the relief of sickness and feebleness of body, or conditions of unusual fatigue, alcohol can be beneficially used under the advice of a physician."

In the chapter on the Nervous System, the subject is still more elaborately treated, but wholly with reference to the effects of alcohol *per se*, though descriptive of conditions common to the excessive use of alcoholic spirits both physically and morally. Of the milder stimulants—wines and malt liquors—nothing is said.

We have before taken occasion to remark upon the results to be feared from this effort of the advocates of total abstinence in the school-room, lest the partial knowledge taught prove in the end to be more dangerous than no special instruction on the subject at all; and the work before us adds to our fears. The care taken to represent but one side of the question, that alcohol is always a poison, on the same plane as opium, chloral, arsenic, and other poisons, and the total shirking of the question of wine and beer drinking, are well calculated to rouse the spirit of inquiry in the minds of all who study it.

THE HEALTH JOURNAL AND RECORD OF SANITARY ENGINEERING: A Monthly Review of Sanitary Science, and of Voluntary Effort for the Public Good. Annual subscription, three shillings. Manchester, England.—This periodical is now in its second year, and shows growing skill in the excellence of

its excerpta, and increasing command of material in the promotion of its declared purpose. With so much of example as England presents in the progress of practical sanitation, profitable precepts may always be deduced from the pages of the *Health Journal*, and we wish for it what it eminently deserves, an extended circulation.

HOMŒOPATHIC MEDICAL SOCIETY OF THE STATE OF OHIO.—Proceedings of the Twentieth Annual Session, held at Cleveland, May 13, 1884. The members of this Society evidently consider sanitary science an important factor in the welfare of their State, and the "Bureau of Sanitary Science" the chief chapter in the Society, for of 180 pages of the published papers, thirty-eight are devoted to the following subjects: Natural Law applied to Etiology, by E. R. Eggleston; Hygiene of the Vocal Organs, by C. L. Cleveland; The Hot Springs Sanitary Resort is a particularly interesting account of six weeks' practical observation, with a summary of the general properties of the Springs, by D. H. Beckwith; and The Great Enemy of Sanitary Science—Intemperance, by H. B. Van Norman.

The "Bureau of Sanitary Science" for the ensuing year is composed of Drs. Eggleston, Carpenter, Beckwith, Van Norman, Logee, Cleveland, Sherwood, and Gann.

MANUAL OF OBSTETRICS is another one of Wood's Pocket Manuals, by E. L. Partridge, M.D., in which is concisely given an outline of obstetric knowledge necessary to the medical student and practitioner. New York: William Wood & Co.

HEALTH MISCELLANY is the title of an illustrated octavo pamphlet published at 25 cents by Messrs. Fowler & Wells, 753 Broadway, New York. It contains a series of papers devoted to important health topics, opening with a concise article on the External Senses, with illustrations of the eye, ear, nose, tongue, and skin, giving important information in regard to the functions, and also the care of these important organs of the body. The next is an illustrated article on the Cause and Cure of the Backache, especially found among so many women. And following this, articles on the

hydropathic treatment of catarrh and fevers; a brief chapter on Ethnology, and an excerpt on "Popular Physiology," by R. T. Trall, M.D.

OGILVIE'S HANDY BOOK OF USEFUL INFORMATION, is the title of a little book of 128 pages, which contains statistical tables of practical value for almost every department of human effort. The Political, Historical, and Biographical information alone is worth double the price of the book. It is bound in handsome leatherette, flexible covers, and will be sent by mail for 25 cents; or bound in silk cloth, for 50 cents, by J. S. Ogilvie & Co., Publishers, 31 Rose Street, New York.

OUR NEWSPAPER.—According to Edwin Alden & Bro.'s (Cincinnati, O.) American Newspaper Catalogue for 1884, there are 14,867 newspapers and magazines published in the United States and the British Provinces. Total in the United States, 14,176; in the British Provinces, 691; divided as follows: Dailies, 1,357; Tri-Weeklies, 71; Semi-Weeklies, 168; Sundays, 295; Weeklies, 10,975; Bi-Weeklies, 39; Monthlies, 1,502; Bi-Monthlies, 26; Quarterlies, 83; showing an increase over the publications of 1883 of 1,594. The book is a handsome volume of 850 pages, and will be sent to any address, prepaid, on receipt of $1.50.

HOUGHTON, MIFFLIN & CO., of Boston, have issued a new edition of the Portrait Catalogue of their publications. It embraces a list of all the books they publish, under the names of the authors arranged alphabetically, and in many instances describes the books or gives their contents. It contains new portraits of many of their distinguished authors: Agassiz, Browning, Bryant, Alice and Phœbe Cary, Joseph Cook, Cooper, Emerson, John Fiske, Bret Harte, Hawthorne, Miss Jewett, Lucy Larcom, Lowell, Parton, Miss Phelps, Mrs. Stowe, Mrs. Thaxter, Thoreau, and Whipple; besides those included in previous editions: Aldrich, Hans Christian Andersen, Björnson, John Burroughs, Fields, Holmes, Howells, James, Longfellow, Scudder, Stedman, Bayard Taylor, Tennyson, Charles Dudley Warner, Mrs. Whitney, and Whittier.

In addition to the works of the above-named authors, this Catalogue comprises those of the following writers :—

Bacon, The British Poets from Chaucer to Wordsworth, Dr. John Brown, Carlyle, James Freeman Clarke, F. Marion Crawford, Richard H. Dana, Jr., De Quincey, Dickens, Goethe, Homer, Hoppin, Hughes, Mrs. Jameson, Samuel Johnson, Starr King, George H. Lewes, Henry Cabot Lodge, Macaulay, Owen Meredith, Montaigne, Mulford, Munger, Pascal, Piatt, Adelaide Procter, Abby Sage Richardson, Saxe, Scott, Seward, J. C. Shairp, Shakespeare, Dean Swift, George Ticknor, Virgil, Richard Grant White, and hundreds of others.

This Catalogue, which appears in an attractive new cover, will be sent free to any one requesting it.

AMERICAN NEWSPAPER ANNUAL FOR 1884, N. W. Ayer & Son, Philadelphia: contains a carefully prepared list of all newspapers and periodicals in the United States and Canada, arranged by States in Geographical Sections, and by Towns in alphabetical order.

It gives the Location, County-seat, and Population of every County, and the Character of the Surface, the Nature of the Soil, and its adaptability to the growth of the various Agricultural Staples of every State, Territory, and County in the United States, and of each of the Canadian Provinces.

Price, $3.00, carriage paid.

MEDICAL RECORD VISITING LIST, OR PHYSICIANS' DIARY FOR 1885. New York: William Wood & Co.

We have only to say what we have said of the previous issues, that it is a most comprehensive, concise, compact and handsome publication; a necessary part of every physician's armamentarium.

ETIOLOGY OF PULMONARY PHTHISIS. By B. F. Westbrook, M.D., Physician-in-Chief to Department of Diseases of the Chest, St. Mary's General Hospital, Brooklyn; Visiting Physician to Long Island College Hospital; President Brooklyn Pathological Society, etc. Pamphlet of 23 pages reprint from *New York Medical Journal*, read before American Climatological Association, May 3, 1884.

A careful study on the accepted doctrines of hereditary and

acquired tendencies, habits of life, and surroundings. Of the special influence of climate little is said, and that in accordance with commonly accepted views, of the benefits of altitude and equability; but not forgetting its comparative exemption in some low countries and on islands with excessively variable climates.

PHTHISIS PULMONALIS, ETC. By L. H. Wood, M.D.—This is a pamphlet reprint of 18 pages, from *Denver Medical Times*, criticising the physiological reasoning of some of the writers on the *modus operandi* of altitude on phthisis pulmonalis, but urging it—with dryness, as common to Minnesota—as the most beneficial of all conditions.

LAL: A Novel. 12mo, pp. 466. By William A. Hammond. New York: D. Appleton & Co.

The author of this book is so well known as an accomplished writer and distinguished author on scientific subjects, that it is difficult to look upon this book as the production of an amateur. Yet it is verily so—it is his first novel; and had he written it thirty years ago, before his reputation was established as an accomplished writer, it would doubtless have been heralded as an unusually successful first effort. However this may have been, rarely have we read a story which so well combines elegance of diction and keenness of perception in portraying the distinguishing features of innate and acquired elements of human character, with only so much of exaggeration as is necessary to make sharp lines of distinction and strengthen the impressions. The story is pitched in the wilds of Colorado, when it was a Territory and invited thither adventurers, prospectors, scientific travellers, fortune seekers, gamblers, horse-thieves, highwaymen, and what-nots of every conceivable variety. From these the hero and the heroine are chosen from the better sort. The gauntlet they ran, and the victory they finally won against the most trying odds, is a tale with a moral so good and so well calculated to improve the mind and heart of the reader that it should, and we hope will, have many readers.

PUBLICATIONS RECEIVED.

REPORT OF THE COMMISSIONER OF EDUCATION, 1882–83. Washington: Government Print.

CIRCULAR OF INFORMATION OF THE BUREAU OF EDUCATION. No. 4. 1884. Washington: Government Print.

INTERNATIONAL HEALTH EXHIBITION LIBRARY CATALOGUE. London: Wm. Clowes & Son.

REPORT OF THE COMMITTEE ON STATE MEDICINE. By Thad. M. Stevens, M.D. Reprint from the Transactions of the Indiana State Medical Society.

MASSAGE WITH RATIONAL HOME GYMNASTICS. By E. T. Osbaldeston. New York: G. P. Putnam's Sons.

SUGGESTIONS RELATIVE TO EPIDEMIC CHOLERA AND THE USE OF CORROSIVE SUBLIMATE. Second Edition. San Francisco, 1884.

TRANSACTIONS OF THE MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND. Eighty-sixth Annual Session, 1884.

ELEVENTH ANNUAL REPORT OF THE MICHIGAN STATE BOARD OF HEALTH, for the fiscal year ending September 30, 1883. Lansing, Mich.

PUMP WELLS AND WELL WATER OF BROOKLYN. Report of the Commissioner of Health to the Common Council, March 10, 1884. Brooklyn, N. Y.: Printed for the Corporation.

TRANSACTIONS OF THE LOUISIANA STATE MEDICAL SOCIETY. Sixth Annual Session, 1884.

SEVENTH ANNUAL REPORT OF THE HEALTH COMMISSIONER OF ST. LOUIS, MO., 1884.

PROCEEDINGS OF THE CONNECTICUT MEDICAL SOCIETY. Ninety-third Annual Convention, 1884.

SANITARY CONTROL OF THE FOOD SUPPLY. By Wm. K. Newton, M.D., Paterson, N. J.

REPORT OF THE BOARD OF HEALTH OF HUDSON CO., N. J., 1883.

HOSPITAL SUNDAY AND HOSPITAL SATURDAY. By H. C. Burdett. London: Kegan Paul, Trench & Co. 1884.

A PERIODICAL AFFECTION OF THE LIVER, Believed to be Located in the Liver, its Capsule, or both, or Possibly an Irritation of the Capsule of Glisson. By R. Harvey Reed, M.D., Mansfield, Ohio. 1884.

IRRITATION OF THE PROSTATE. By R. Harvey Reed, M.D., Mansfield, Ohio. 1884.

THE OXFORD MOVEMENT. Rev. Morgan Dix, D.D., New York.

INFLUENCE OF LUNG RETRACTILITY IN PLEURISY AND PNEUMO-THORAX. By F. Donaldson, M.D. Baltimore: Journal Publishing Company.

THE SANITARIAN.

NOVEMBER, 1884.

NUMBER 180.

POLLUTION OF THE UPPER OHIO, AND THE WATER-SUPPLY OF THE CITIES AND CHIEF TOWNS WITHIN THE FIRST HUNDRED MILES OF ITS COURSE.*

By James E. Reeves, M.D.,

Secretary of the State Board of Health of West Virginia.

THE condition of health and probable duration of life of a people may be correctly measured by the quality and quantity of their water-supply. Indeed, good health can as little be supported without pure water as without pure air; therefore, of all the diversified and complex relations which man bears to surrounding influences, none are more important than that which relates to the water-supply of the locality in which fortune has placed him.

Considered either in his physical, social, moral, industrial, or political relation, the subject is of transcendent importance, for it involves the main questions of success in life. If he take up his abode in the midst of unsanitary surroundings, the inevitable sequence will be a correspondingly unfavorable influence

* Read before the American Public Health Association, St. Louis, October 16, 1884.

upon his destiny—a check upon his prosperity, and a blight, more or less serious, upon all those attributes which are usually considered essential to his well-being and happiness.

As a natural corollary, the community which is ignorant or regardless of its sanitary surroundings and vital history is but feebly defended against "the pestilence that walketh in darkness, and the destruction that wasteth at noonday;" for the wholesome lessons of domestic and civic hygiene afford to such a people no rules and defences for the person, the domicile, the municipality, and the state, nor encouragement to the general prosperity in stimulating the practical applications of science and art, commercial enterprise, manufactures, and popular intelligence. All these are at a low standard, while frequently recurring endemic and epidemic diseases, and a high death-rate, constitute the most prominent features of their culpable history.

River pollution from sewage and other supplies of refuse and corruption in towns and cities has assumed such fearful proportions that the question presses itself upon wise men and sanitarians: "Is industry free to tumble out whatever horror or refuse it may have accumulated into the nearest crystal brook, regardless of gods and men, and little fishes; is free industry free to convert all our creeks and rivers into sewers?" "It is ours," says Dr. Gairdner, "to use air and water, and then pass them on; but woe to the man or the community that detains or imprisons these his servants of the hour in their further execution of God's endless work!"

With these introductory reflections, I now submit the following brief statement of facts relating to the water-supply of the cities and chief towns situated on the banks of the Ohio, within the first hundred miles of its course.

Commencing at the head of the Ohio, there are two cities, Allegheny and Pittsburg, whose aggregate population is not less than 240,000. Next, Rochester, Pa., a town of 3,500 population; next, East Liverpool, O., with a population of 6,000; next, Wellsville, O., with a population of 4,500; next, Steubenville, O., with a population of 14,000; next, Martin's Ferry, O, opposite Wheeling, with a population of 4,000. On the West Virginia shore, between Wheeling and Pittsburg, the principal towns are New Cumberland, with a population of

1,500, and Wellsburg, sixteen miles distant from Wheeling, with a population of 2,000; next, Wheeling, with a population of 31,500; next Bellaire, O., with a population of 10,000.

And thus, not including many smaller towns and thriving villages which mark every few miles of the Pennsylvania and Ohio shore, and whose varied industries in manufactures give employment to thousands of laborers, there are above Wheeling four cities and five towns whose aggregate population amounts to 275,000.

Besides refuse representing accumulations of filth of every conceivable character from family domiciles, manufacturing establishments, stable- and barn-yards, privy-vaults and other cesspools, and sewage outlets, the Ohio River is made the convenient receptacle for the disposal of diseased or worthless carcasses; and thus thousands of tons of corrupting matter are daily thrown into the stream which supplies the water we drink. No wonder then that diarrhœas and typhoid fever are so common, and the death-rate from these diseases is so high.

But let me be more specific in my statements. Passing Rochester, at the mouth of Beaver River, twenty-six miles below Allegheny and Pittsburg, without further record than that its water-supply is from wells contaminated with surface putrilage, and in many instances, no doubt, by leaks from privy-vaults and drains from kitchen sinks, and that typhoid fever is a frequent disease in that community, we come to East Liverpool, nineteen miles further down the stream. Here the population is supplied with water pumped from the Ohio, and distributed from a reservoir. The supply-pipes to the pumps are located about two hundred yards above the city, and extend into the river far enough to take the water from the current, below low-water mark.

There are but few wells in use; and fewer cases of typhoid fever have occurred since the erection of water-works than before, or when the water-supply was wholly drawn from wells. During those years; house and street epidemics of typhoid fever were not infrequent.

At Wellsville, four miles below East Liverpool, a well, or crib, as it is called, was made near the river's edge, a year or two ago, for the purpose of securing for the town a sufficient supply of clear water—the authorities believing *clear* water and

pure water to be convertible terms. This crib, 10 by 16 feet in the square, and 12 feet deep, was encased with timbers and tightly covered with the same material. From such "a hole in the ground" the water-supply was pumped into a larger basin on the hill. It was confidently expected in that way to procure "pure filtered water from below the bed of the river;" but the supply was found to be so foul and unwholesome that it was not fit for use, and the crib had to be abandoned. Since then, the supply has been pumped directly from the river, above the inflow of the town's refuse, and distributed from a reservoir three hundred feet above the river-level. But this better water-supply has not secured the citizens of Wellsville against typhoid fever cases which appear at all seasons of the year.

For the foregoing history of the sanitary situation in East Liverpool and Wellsville, I am indebted to R. H. Hill, Esq., of East Liverpool, and Dr. J. W. Hammond and S. Stevenson, Esq., of Wellsville.

From Steubenville, twenty miles below Wellsville, Dr. Gustav Shane, of that city, has kindly sent me the following description. He says: "This city is supplied with water pumped from the Ohio River into a large reservoir on a neighboring hill, and from thence direct to the consumer by mains and cross-mains. The basin or reservoir is made of brick laid in and covered with cement, and of sufficient capacity to supply the ordinary wants of the population—fourteen thousand—for about three days. The supply is taken at a point *below* both the geographic and population centre of the city, but the receiving-pipes are laid to and beyond the channel, so as to avoid contamination from surface drainage and sewage.

"The quality of the water drawn from the mains is apparently good, clear, free from odor, and not unpleasant to the taste except when the river is turbid. But few wells are in use in the main portion of the city; but a part of one ward—on the first river-bench—is partially supplied with well-water.

"The city is not sewered, and the privy system is the time-honored one of deep vaults, which, when full and abandoned, are covered with earth; and in that way the surface is completely honey-combed.

"There are, at all seasons of the year, cases of typhoid

fever occurring sporadically; but the disease has not prevailed as an epidemic for many years. The part of the city in which well-water is used appears to have the largest percentage of febrile cases, and, I believe, a preponderance of the typhoid type. Dr. Stanton, the oldest practitioner in the city, whose experience antedates the river water-supply, informs me that typhoid fever was much more common under the well-system of water-supply than since the establishment of the water-works. Thirty-five or forty years ago, or before the adoption of the river supply, house and neighborhood epidemics of typhoid fever were quite frequent, whereas, at present, such outbreaks are almost entirely unknown.

"Isolated cases of diphtheria are also constantly occurring at irregular intervals in Steubenville, but there has been no general visitation of this disease within the last fifteen years. During the winter of 1878 and 1879, a fatal neighborhood-epidemic of diphtheria occurred, limited by street lines, and embracing about one-fourth of the population of the city. Scarlet fever prevailed at the same time in severe form, and in many instances the two diseases—scarlet fever and diphtheria—were associated in the same patient. There seemed to be no cause for this visitation other than contagion."

The next place on the line of this inquiry is Martin's Ferry, twenty miles below Steubenville, and immediately opposite Wheeling. Here the water-supply is from wells varying in depth from fifteen to fifty feet, dug through a rich loam, yellow and blue clay, sand and gravel. The town is not sewered, and in some instances the well and the privy-vault are in dangerous proximity. On account of the general topography of the town, and the superficial clay-substratum, all refuse and surface matter which does not find immediate entrance into the well-water supply, is quickly drained into the Ohio River. The result of the unsanitary condition is the constant prevalence of typhoid fever of a grave and fatal type in Martin's Ferry.

And now having reached Wheeling, the chief city in West Virginia, the situation is even more uninviting than the unsanitary pictures we have been inspecting; for it is within the truth to tell that, including the population of Martin's Ferry, the refuse from the homes of ten thousand people finds entrance into the Ohio River immediately *above* the point of supply to

the water-works' pumps. And if filth from hundreds of households, manufacturing establishments, privy-vaults and other cesspools, horse- and cow-stables, and the stinking bodies of dead animals, were all of the sources of pollution of the water-supply of Wheeling, its citizens might congratulate themselves that, at least, they are not worse off than some of the neighboring cities; but in addition to the sources of pollution just mentioned, an old and dilapidated cemetery—Mt. Wood—occupying the hill at the northern part of the city and within a half mile above the water-works, is a highly probable factor of contamination.

The greater part of the coal measure underlying this cemetery has been removed, and the cap-rocks have broken and sunken, causing large seams or cracks through the hill; and the inclination of drainage, both surface and subterranean, being toward and into Jonathan's Ravine, which empties its current into the Ohio River within the city limits, it is therefore highly probable that the water-supply in the basin is polluted by the corruption escaping from the graves and vaults in Mt. Wood.

The water-works, though greatly improved by new machinery within the past year, occupy the same site upon which they were originally erected more than forty years ago, when Wheeling had not one-fifth of its present population—31,500.

The basin or reservoir is located on Wheeling Hill, 275 feet above the bed of the river, and has a capacity of 800,000 gallons. Its small size necessitates constant use of the pumps both day and night to keep the mains full; therefore, at all times, the quality of the water in the basin is the same as that in the current of the river. In other words, if the water in the Ohio is muddy, the supply in the basin is likewise turbid and disagreeable to drink.

In hope of securing a clear and wholesome water, but unmindful that clear water is not always pure water, the Board of Water Commissioners last year concluded to repeat, with some improvements, the experiment made at Wellsville of a crib or well below the bed of the river; and accordingly a hole 15 feet deep and 20 feet in diameter was dug through the sand-bar in the bed of the river near the island shore, and about two hundred yards above the present point of supply to the basin. This well or crib was substantially walled with brick laid

in cement and tightly covered with heavy timbers, bolted to the wall, to prevent all leakage from the current. The water that soon filled this well or crib, by percolation, was so clear and beautiful in appearance that the Board, a few weeks ago, contemplated the immediate establishment of three additional cribs, side by side with the one just described. Fortunately, however, before making such outlay of the public money, and connecting such cribs or wells with the water-works and the basin, the Board wisely determined to have the waters in the crib and in the basin analyzed; and specimens were forwarded to Dr. Charles Smart, of the United States Army, for that purpose. The following is Dr. Smart's report of the analysis:

"SURGEON-GENERAL'S OFFICE,
"WASHINGTON, D. C., September 26, 1884.

"DR. JAMES E. REEVES, *Secretary State Board of Health, Wheeling, W. Va.*

"DEAR SIR: I have received yours of the 19th inst., invoicing two half-gallon specimens of the water-supply of the city of Wheeling, W. Va., and requesting me to make an analysis of the water and to report in such terms as may be authorized by the results of the analysis. The specimens were received in good condition, in green glass bottles securely corked. One was marked 'No. 1, Island Crib;' the other, 'No. 2, City Reservoir.'

"NO. 1.—This water was clear, transparent, and free from color and odor. A slight sediment of a dark color, pulverulent and somewhat granular, had collected in the bottom of the bottle. This sediment consisted of organic matter so disintegrated that its origin could not be discovered; several of the larger granules were composed of the disintegrated matter aggregated on small fragments of cotton fibre. It swarmed with bacteria and bacilli, and showed many minute protoplasmic masses and some larger masses presenting amœboid movements, but contained none of the algæ and infusoria which are so common in waters that are in general use as potable waters. Generally speaking, waters that are free from the actively-moving ciliated infusoria, and that present a comparatively dead microscopic field, are waters that have percolated through a very pure or a very impure soil. In other words,

they are very pure spring- or very foul well-waters In the one case, the field presents silicious particles, diatoms, and the filaments of the confervoid genera; in the other, the microscopic appearances are those mentioned as observed in the sediment of the specimen under discussion.

"Under laboratory treatment the water was found to give a residue constituting 49 parts in the 100,000. Twenty of these parts were dissipated by heat, and consisted principally of the nitric acid of nitrates. There was but little recent organic matter in the residue, scarcely enough when ignited to darken the inorganic film with a fleeting coloration. In this respect, the water-residue was similar to that of a pure spring-water; but it differed from the latter in the strong nitrous fumes which were evolved during the application of the heat. The presence of the nitric acid was also developed by Sprengel's solution; but it was not considered needful to determine its amount directly, as the operations on the residue indicated that two-thirds of the 49 parts in every 100,000 of the water consisted of nitrates, and the remainder of chlorides, carbonates, and sulphates.

"The chlorine present amounted to 1.9 part in 100,000 of the water, which is equivalent to 3.1 parts of chloride of sodium. This is not a large chlorine figure, considered in connection with the nitrates present, and indicates that the organic matter whence the latter are derived is not wholly, or, indeed, chiefly, a sewage material, although sewage may be present in it.

"The free ammonia in the water measured .014 part per 100,000. This is a larger quantity than is usual in percolated waters known to be of good quality, and indicates, with the strong trace of nitrous acid which was found by Griess' delicate test, that the organic matter from which the nitrates are formed is not distant from the reservoir in which the water is collected, or that the filtering material or soil through which percolation is effected is itself of such an impure character as to be incapable of effectually purifying the water in its transit.

"A similarly small amount of recent organic matter is indicated by the quantity of oxygen required to oxidize it, to wit: .110 part per 100,000 of the water.

"From the rapid manner in which the albuminoid ammonia

was eliminated in the laboratory experiment, from the relatively small proportion of carbon present, as indicated by the small quantity of oxygen required, and from the large amount of nitrates and small amount of carbonates in the residue, it is inferred that the small quantity of organic matter present in the water and the very large quantity which has recently been reduced to the inorganic form of a nitric acid salt, are of animal derivation. No undecomposed sewage is present in the water, but the quantity of chlorine renders it probable that decomposed sewage is not absent.

"In the absence of all knowledge of the surroundings or natural history of this water, the analyst cannot speak with decision on its probable unwholesomeness. The microscopic appearances of its sediment are against it as well as the greater part of the analytical results. It is true that there is in the water only a small quantity of unreduced organic matter, but there was a much larger quantity present in it a short time before it reached the reservoir whence it was drawn. This water, indeed, appears to be an example of the class which led the writer to generalize as follows in his report on the waters of Memphis and other Southern municipalities ('Annual Report of National Board of Health, 1880,' page 485): 'On the other hand, when a well which is liable to an impure inflow, as evidenced by the coexistence of nitrates and nitrites, furnishes a sample which is free from albuminoids and from oxidizable organic matter, the microscopic characters may give direct assurance that the water has not always been as pure as the sample submitted for analysis.'

"Although there is not much organic matter in the water submitted, the surroundings of the reservoir from which the water was collected are evidently such that at any time an increased inflow might carry undecomposed organic matter into it. As it is, the last traces of the organic matter are in progress of change. The nitrogen of the nitrates in a water may be as much dissociated from the organic matter which it at one time constituted, as the chlorine of the chlorides in the water of the ocean, but in this instance the nitrates are undoubtedly a recent formation, for the process of reduction is in progress in the water submitted for examination. Nitrates alone are viewed by most sanitary authorities as indicating dangerous

probabilities in a water. Frankland says that large quantities of nitrates convict water of previous pollution by organic matters of animal origin, and calls them an indication of the 'previous sewage contamination' of the water. Some, as Ekin, of London, condemn as dangerously polluted waters which contain so small a quantity of nitrates as .5 or .6 part per 100,000 and Reuben Haines has met with cases which sustain Dr. Ekin's position. Without subscribing to the dangerous qualities of waters which contain so small a proportion of nitrates, the experience of the writer leads him to believe that, excluding the presence of existing organic matter, a water is to be regarded with suspicion in proportion to the amount of the nitrates present, and that assuredly the water-supply of a city should not contain the very large quantity of nitrogen as nitrates which was found in the sample marked 'No. 1, Island Crib,' from Wheeling, W. Va.

"More particularly dangerous are the waters which show a connecting link between the nitrates and their organic derivation in the form of traces of existing nitrites. In a recent investigation into the processes of water analysis, Professor Mallet, of the University of Virginia (now of Jefferson Medical College, Philadelphia), under whose direction the experiments were conducted, concluded that the danger was associated with the presence of nitrates and nitrites. In his report (page 203, 'Annual Report National Board of Health, 1882') he says: 'Looking at the results from the natural waters of Class I. and II., and bearing in mind the conclusions reached by Müller, Schlaesing and Muntz, Storer, Warrington, and others as to the process of nitrification being due to the presence of an organized ferment or ferments of bacterial character, the idea suggests itself whether the noxious characters of waters containing largely nitrates and nitrites—themselves presumed to be harmless—and but very little organic matter—which ought to be present, of some sort, to support the previous contamination view—*may not be in reality due to the presence of a specially nitrifying ferment, itself to be classed among the lower organisms capable of propagating disease.*'

"Nitrates and nitrites are harmless in themselves so far as we know. So, also, are the ordinary organic matters, animal and vegetable, from which these salts are formed, at least when

existing in quantities which do not render the water containing them repugnant to the senses. It is not the ordinary organic matters of the world, decaying garbage, animal fragments, and even sewage, nor the nitrogen salts formed from them, that are dangerous when taken into the system with the water-supply, but certain morbific micro-organisms which may accompany them. These micro-organisms, which are the probable cause of cholera, typhoid fever, and other specific diseases, are associated in particular with waters which contain nitrates and nitrites; and, indeed, it is not unlikely that the living ferment which effects the nitrification of organic matter may itself be morbific.

"NO. 2, CITY RESERVOIR.—This water was clear, transparent, and free from color and odor. It contained a slight pulverulent sediment of an olive color, which consisted of disintegrated organic matter, and some mineral particles, swarming with infusorial life, but without any algoid forms and with few bacteria.

"The water yielded a residue amounting to 14 parts in the 100,000; of these, 10 parts were mineral matter and 4 organic and volatile. The organic matter was not present in such quantity as to give a dark coloration on ignition of the residue, nor were any fumes or odors evolved during the process. Chlorine was present to the amount of 2.1 parts, equivalent to 3.5 parts of chloride of sodium in every 100,000 parts of the water. No nitrates were present other than the minute quantity—less than Dr. Ekin's limit—usually found in river-waters. A trace of nitrous acid was present, indicating that the organic matter of the water was undergoing change to the inorganic condition. The free ammonia amounted to .013 part, and the albuminoid to .017 part per 100,000 of the water, while the oxygen required to oxidize this weighed .160 part.

"River-waters are very variable in their constitution. During the periods of spring snow-meltings and autumnal rainfalls, when the stream is swollen and turbid, its waters usually attain their maximum of impurity. The organic matter on the surface of the area of drainage is washed into the bed of the stream, and the rapidity of flow prevents sedimentation, which is an important purifying agent. In seasons of drouth, on the other hand, when the water-level is low and the current fed less by

surface-shed rain-showers than by tributary springs, the water is usually less impregnated with organic matter. From the transparency of the sample furnished, and its minute quantity of pulverulent sediment, the analyist infers a low water-level at the time the specimen was collected. The specimen therefore represents the river-water in its best condition. The albuminoid ammonia distilled from the sample is not above the average of that obtainable from good river-waters; but the free ammonia and chlorine are in excess, and suggest a sewage inflow into the stream. If sewage were suspected to enter in mass at one particular point, its influence on the quality of the water might be ascertained chemically by determining the free ammonia and chlorine in specimens collected above and below the point of supposed entry; but usually such determinations are unnecessary, as the point at issue may be better determined by a sanitary inspection of the area of drainage.

"Sewage is decomposed by the influences acting in running water and leaves only its skeleton in the form of the inorganic chlorides. The presence of the evanescent ammonia indicates a more recent contamination and a less perfect decomposition. But whether decomposed or undecomposed, sewage contamination is dangerous, not in itself, for waters polluted with sewage have been used for ages with impunity, but in that it may be accompanied by and be the means of spreading the infection of typhoid fever and cholera. The former has long been known to be preventable by the use of water which is free from sewage contamination, and the recent researches of Koch into the etiology of the latter indicate that a sewage-contaminated drinking-water supply is the most active agent in its propagation. Respectfully submitted,

"CHARLES SMART,
"*Surgeon U. S. Army.*"

The following supplemental report is not less interesting and instructive.

"SURGEON GENERAL'S OFFICE,
"WASHINGTON, D. C., September 29, 1884.

"DR. JAMES E. REEVES.

"DEAR SIR: Your letter of the 26th instant, informing me of the history and surroundings of the water sent to me for

examination, and marked respectively 'No. 1, Island Crib,' and 'No. 2, City Reservoir,' has been received and carefully considered in connection with the analytical results obtained from the waters in question. In my report on 'No. 2, City Reservoir,' I stated the probability of sewage inflow, and suggested a sanitary inspection of the drainage area as a more trustworthy means of determining a contamination of this character than is the laboratory work of the sanitary chemist. If the sewage is present in large quantity, and is not decomposed by natural causes, the urea present may be detected and estimated by the chemist. But urea is speedily broken up and leaves only the chlorides which accompanied it, without a trace of free ammonia to evidence its recent existence. The sanitary inspector is, therefore, better qualified in many instances than the sanitary chemist to detect the presence of sewage in a water. Especially is this the case in surface waters where the water-shed and all its possible polluting influences are more or less known.

"The germ or poison of typhoid fever may or may not be present in sewage. If it be not present, the sewage is harmless so far as concerns the propagation of that disease; if it be present, the water will convey the infection of typhoid fever whether the sewage is decomposed or not. In fact, there is no evidence that the agencies which destroy ordinary organic or sewage matter in its course down stream have the slightest influence in destroying or removing the cause of this fever. On the contrary, all the evidence that has accumulated of late years shows the persistence of the germ or poison after the destruction of the sewage material which originally accompanied it. In the Lausen epidemic, for instance, there was not only a flow of several miles, but a filtration through the soil which sufficed to remove the minute cells of wheat starch; yet the fever was undoubtedly disseminated by the infected water of the springs.

"Instances of typhoid fever caused by well-water from which all trace of the sewage has disappeared are of common occurrence in the recent records of medical progress. Before a city which uses a sewage-polluted water-supply can claim that the use of such water is not injurious or unwholesome, its health reports should show that typhoid fever is a rare disease among

its citizens, although existing in the cities which cast their sewage into its water-supply.

"The detection by chemical means of sewage in a water is therefore a matter of no moment. The point of interest is the contamination of the water-supply. If this is proved, the water is dangerous, and is undoubtedly the cause of much preventable sickness, which is accepted by force of habit as a normal condition.

"It is not always in the power of an individual to prevent the sewage-pollution of his water-supply by others who live above him on the water-shed, but it is always in his power to prevent his water-supply from being defiled by his own excreta. The sanitary laws which apply to individuals apply to their aggregation as communities. The city may not be able to prevent all defilement of the stream, but it is surely competent to preserve its citizens from swallowing their own filth, diluted but not rendered innocuous thereby, in its organized system of water-supply.

"The water marked 'No. 1, Island Crib,' which I reported to you as a surface water that received a large amount of nitrates and nitrites during its percolation through some filtering material, I now understand to be the river-water which has percolated through a sand-bar into a well or other reservoir. When the river is flooded and turbid, the filtration, of course, will remove the turbidity and give a clear water. But clearness and purity are not synonymous terms when applied to water-supplies. A water which contains strychnia might be perfectly clear. The Lausen water, in Switzerland, above referred to as having caused a deadly epidemic, was perfectly clear. At the present time the river-water is as clear as the filtered water. They are, however, by no means the same waters. The one contains only 14 parts of solid matter per 100,000, the other 49 parts. The increase is the result of the filtration. It consists of nitrates and nitrites recently formed from organic matter. The organic matter which yielded them did not exist in the river-water. It was therefore derived from the filtering medium, and freedom from turbidity is purchased at the expense of a dangerous change in the character of the water. I need not repeat what I have already said in my report as to the quality of this water. It is wholly unsuited for a potable

water-supply, especially for a large community where the well-being of so many is at stake.

"Sincerely yours,

CHARLES SMART,

"*Surgeon U. S. Army.*"

It is thus seen how narrowly the people of Wheeling escaped a positively dangerous water-supply; and it is to be hoped other communities may profit by the example. When Dr. Smart's report is read by the light of the history I have given of the surroundings of the water-supply, especially by the light of that unerring indicator of the character of the water-supply—the frequency of typhoid fever—it leaves no doubt on the subject.

An interrogation of the death-returns on file at the City Health Office shows that in the last ten years there have been 460 deaths from typhoid fever in Wheeling, and 225 deaths from diphtheria within the same period. Indeed, typhoid is present at all seasons, some years showing a much larger mortality than in others. For example, in the year 1879 there were 90 deaths in Wheeling from typhoid fever, while in 1880 there were but 52 deaths from the same cause. The same is true of the prevalence of diphtheria.

There is an easy remedy for the present impure water-supply in the city of Wheeling, namely, the extension of the receiving pipes three miles up the river, or to a point above the town of Martin's Ferry. When this improvement shall have been made, Wheeling may justly boast of having an abundant supply of the purest water the Ohio River can furnish, and fewer cases of typhoid fever.

The next and last city to be named in this record is Bellaire, O., the northern limit of which is but a half-mile below the southern boundary of Wheeling. It has a population of ten thousand, and is supplied with water pumped from the Ohio at a point within half a mile below the place used by the city of Wheeling for dumping night-soil and other corrupting refuse. In other words, the citizens of Bellaire swallow with the water they drink all manner of abominable filth from the city of Wheeling, and they pay a fearful penalty for their utter disregard of sanitary laws. Typhoid fever and diphtheria prevail in malignant

form at all seasons, and the death-rate from these diseases exceeds that from all other causes combined.

Finally, it were well if the boasted civilization and refinements of the age in which we live could be presented in fitting contrast with the sanitary works of the ancient Greeks and Romans, who well understood the value of pure water. Vitruvius informs us that as an evidence of the practical wisdom of the ancient Romans, who were often regulated in their conduct and opinions—especially in military matters—by the augurs and soothsayers, they frequently consulted the appearances presented in the livers and spleens of animals with a view of ascertaining the state of the air and the waters of a country, the healthfulness of its food-productions, its pasturage, etc., and to regulate their choice of sites for the building of cities.

Even to this day, though so far fallen from her high estate, Rome is supplied with good water conveyed from a great distance by aqueducts which were built in the days of her splendor and renown.

THE CHOLERA IN EUROPE.

IN THE SANITARIAN for June last it was stated that the severe epidemic of cholera which, in 1883, had visited Egypt and the shores of the Red Sea, was likely to extend farther, and that: "The number of lives lost and the threatening attitude which the disease maintained for many months in regard to Southern Europe, gave it more than usual interest." The fears then expressed were subsequently verified by the occurrence of cholera at Toulon about the middle of July. This epidemic has occupied the attention of the people, and especially of the medical profession, almost to the exclusion of every other subject. The disease has hitherto always taken a westward course and its existence in Europe reminds us that it would be prudent to adopt such measures, on our Eastern seaboard, as are most likely to prevent the introduction of the disease should it be brought here next summer. It is of no use to make light of the danger; the people should hold the

Government and the sanitary authorities responsible for any neglect of duty. The responsibility fixed upon the *officials* and accepted, as it must be, it is proper to ask: Who are the officials to be held accountable? Is it the General Government at Washington? Is it the National Board of Health, created for just such work by the representatives of the people, or is it the officers of the Marine Hospital Service? It is well known that for two years past, the National Board has been ignored by the Executive, and that the Marine Hospital Service has received the appropriation for such work. Has the sanitary cordon proved successful, and is it as efficient as aggressive sanitary measures which do not obstruct commerce? If so let the cordon be extended along the Gulf and Atlantic coast from Texas to Maine. It is proper to ascertain what assistance or co-operation may be expected from State officials and State Boards of Health and from local sanitary authorities in commercial centres. In case Canada should be invaded first, it would be of the highest importance to protect our lake frontier.

Upon whomsoever the responsibility may fall, it will obviously be their duty to inquire: What has been done in other countries, and particularly in Europe, to prevent the spread of the epidemic? How far has Quarantine been successful as a protection against the disease? To what extent have *sanitary cordons*, so entirely depended upon by the Marine Hospital Service, been successful in the hands of others?

Cholera exists in France. Cholera is still quite severe in some parts of Italy. Cholera, it is said, has disappeared from Spain. What are the causes that have led to its disappearance from Spain, while it remains in the other countries named? Is it due to better hygienic conditions? Then how has this fortunate result been accomplished? Spain, it is known, has been active and vigilant in view of the threatened danger and, in most places, her sanitary regulations are very efficient.

In France the constant debates, the indecision, the want of fixed principle on which to act, is very disheartening. The outbreak of cholera took everybody by surprise; the people, the authorities and even the members of the medical profession who ought to have shown more coolness in the face of danger. There is not to-day perhaps a city in the country better pre-

pared to meet the danger should it appear at their doors, than was Toulon, Marseilles and others, when the epidemic surprised them. In the various scientific societies the most visionary theories have been discussed; practicable and impracticable measures have been proposed; rival societies have indulged more or less freely in sarcasm and unfriendly criticism, as if the interest at stake was personal and not the public welfare. In the Chamber of Deputies, Paul Bert introduced a ridiculous measure for treating cholera, which was very judiciously rejected. So absurd was it that some of the most eminent among the profession—the editors of the *Journal d'Hygiène*, of the *Polyclinique* and others—proposed to burn their diplomas if the measure became a law.

The only important communication made on the subject of cholera, thus far, is that of MM. Straus and Roux regarding their inquiries into the epidemic at Toulon. According to these gentlemen, Koch has been over-hasty in his conclusions when he attributes to the comma-shaped bacillus, the origin of cholera. A great variety of organisms are found in the intestines of patients with cholera, and this comma-shaped bacillus is the most common among them, but so far, no one has succeeded in producing cholera in animals by inoculating them with the supposed cause of the disease. Another fact is that this bacillus is found only in the intestines and never in the blood nor in any of the tissues. In violent cases of cholera, in which the patient dies suddenly, it is not found at all, not even in the intestines. They state farther that it has been found in the intestines of persons who have never had cholera and they have discovered it in stagnant water in places in which cholera had not been known.

According to the *Journal de Médecine et de Chirurgie Pratiques*, MM. Straus and Roux are extremely reserved in their criticism of Koch. This reserve is incomprehensible to the people outside of the profession who are now studying these microcosms, from newspaper reports of course, with so much interest.

According to the same journal the practical question has advanced no farther than the theoretical, and little more activity has been shown in some places in the removal of filth and

other supposed causes promotive of the disease, but, so far, the measures taken have been quite insufficient.

The treatment still remains the same. It is no doubt very important to treat the premonitory diarrhœa. At Paris diarrhœa, vomiting and even chills have been common for several months previous to the appearance of cholera, though we doubt whether they are necessarily the prodromata of the disease.

T. P. CORBALLY.

NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

ABSTRACT OF PROCEEDINGS.

THE National Conference of State Boards of Health met at Liederkranz Hall, St. Louis, Mo., Monday, October 13th, Hon. Erastus Brooks, of New York, presiding, Dr. J. N. McCormack, of Kentucky, as Secretary, and the following representatives in attendance. Arkansas, Dr. J. A. Dibrell; Connecticut, Dr. C. A. Lindsley; Illinois, Dr. John H. Rauch; Iowa, Dr. W. S. Robertson; Kentucky, Drs. Pinckney Thompson, J. O. McReynolds, and J. N. McCormack; Massachusetts, Drs. H. P. Walcott and S. W. Abbott; Michigan, Dr. H. B. Baker; Minnesota, Drs. D. W. Hand, W. H. Leonard, and C. N. Hewitt; Missouri, Drs. J. C. Hearne, E. H. Gregory, H. F. Hereforth, Albert Merrill, G. T. Bartlett, and G. M. Cox; Louisiana, Drs. S. S. Herrick, S. F. Salomon, and Joseph Holt; New Hampshire, Drs. I. A. Watson and J. P. Conn; New Jersey, Dr. E. M. Hunt; New York, Hon. Erastus Brooks; Rhode Island, Dr. Charles H. Fisher; South Carolina, Dr. T. G. Simons; Tennessee, Drs. J. B. Lindsley and J. B. Thornton; Texas, Dr. R. M. Swearengen; West Virginia, Dr. J. E. Reeves; Wisconsin, Drs. J. T. Reeve, S. C. Johnson, and B. O. Reynolds.

The Chairman, in opening the Conference, congratulated the Association on the large attendance of delegates, which, he thought, indicated the public interest in the health question.

It would be idle for him to repeat anything which had been said in the past in regard to the importance of the work of the State Boards of Health. He was glad to know that nearly every State in the Union had established their boards, and that the few States and Territories which were at present without boards are considering the advisability of establishing them. In the State of New York there are now local health organizations in some nine hundred of the one thousand towns in the State. There were also similar organizations in nearly all the two hundred and forty villages in the State and in each of the twenty-four large cities.

The minutes of the last meeting at Washington were read and approved, after which Dr. Hewitt submitted a number of recommendations for the further and more complete organization of the Association which had been suggested by the Minnesota State Board of Health. After a short discussion the recommendations were referred to a committee, which was requested to report at the meeting on Wednesday afternoon.

An invitation from the American Public Health Association to attend the meetings of that body during the present week was extended to the members of the Conference. The invitation was unanimously accepted. It was stated that the Wednesday afternoon session of the American Association would be devoted entirely to the discussion of questions connected with the work of the Conference of the State Boards of Health.

Dr. Rauch, of Springfield, Ill., and Dr. Charles Smart, of the National Board of Health, had prepared papers on the subject of the prevention of cholera. There was some discussion as to whether the papers should be heard that afternoon or read Wednesday afternoon before the combined meeting of the Association of State Boards of Health and the American Public Health Association. The majority of the delegates regarded the question as one peculiarly connected with the Conference of representatives of State boards, and Dr. Rauch and Dr. Smart were called upon to read their papers.

Dr. Rauch, at the outset, reminded the Conference of the responsibility which rested upon those who were charged with the protection of the public health at the present time.

For a period of six years sanitary effort and sanitary authority have had no unusual demand made upon them.

And during these six years the interest in sanitary matters, which was aroused by the epidemic of 1878, and which, among other causes, led to the formation of many of the present State Boards of Health, and to the creation of the National Board, has gradually diminished as the memory of the epidemic faded away.

One of the chief reasons why sanitary work fails to receive continuous and adequate consideration and support from the public and from the legislator, is that, in its very essence, it is a work of prevention; and just in proportion to its own success and thoroughness does it destroy the obvious and palpable reasons for its continuance. When an epidemic actually exists, and industry and commerce are paralyzed in its presence, and the death-roll swells from day to day, there is then no question in the public mind about the desirability of sanitation, no hesitation as to making appropriations for its support, or enacting legislation to increase its efficiency.

However, there is a revival of public interest in these matters within the past few months, due to the spread of Asiatic cholera in Southern Europe; and it is our present duty, as sanitary officials, to utilize and direct that interest to the securing of adequate legislation and intelligent action for the prevention of the introduction of the pestilence to our shores, and its limitation, should it unfortunately effect an entrance. Much has already been done in the latter direction by the action of State and local health authorities in pushing the sanitary education of the people, through circulars, memoranda, and other modes of appeal. In many instances, sanitary inspections of municipalities, public institutions, jails, almshouses, and kindred establishments, have been ordered and carried out, with the view of securing the abatement of nuisances and remedying defects in the sanitary conditions thence disclosed. An amount of sanitary work has been thus already accomplished, which, aside from any consideration of cholera, will be of great value in reducing sickness and mortality from the entire list of diseases which are caused or favored by filth and other unsanitary conditions.

This work should be continued, and the measures which have already been inaugurated, looking to improvement in general and local sanitation, should be pushed with unabated

vigor during the favorable weather we may yet have; and they should be resumed with redoubled energy whenever climatic conditions permit.

With theories and speculation as to the causation of cholera, or as to its mode of diffusion and epidemic spread in the countries of the Old World, this conference is not concerned. It is enough for us to know, as the basis of our action, and the foundation for practical recommendations and advice, that the disease is not indigenous to this continent; that it is an exotic, and has never yet visited us except by importation, and that only after ample warning.

Until we can very materially change the conditions which cause considerably over one-half the annual mortality, it is our simple duty to adopt whatever measures promise a fair degree of success in excluding the foreign epidemics. Such typical filth diseases as typhoid fever and diphtheria carry off sixty-odd thousand people every year; and during the census year ten principal groups of more or less preventable diseases caused over 470,000 out of the total 756,000 deaths in the United States.

With such a showing it is simply nonsense to talk about relying upon sanitary measures alone to combat a disease like cholera. Let us push sanitation by every means in our power, and to the fullest extent. Not, however, with any hope that we can effect such a sanitary revolution in a few months as would prevent cholera, if once introduced, from spreading as an epidemic in hundreds of localities. But rather in the knowledge that every sanitary reform tells permanently and continuously on the whole body of preventable diseases; and that to the extent and measure of such reforms are the conditions made more favorable for the exclusion and prevention of all epidemics.

That cholera *will* come, it is our duty to assume. Mindful of the history of every previous cholera epidemic, we must accept as beyond a doubt—if experience is worth anything—the certainty that the disease will be brought to our shores. It always has come, sooner or later, whenever, since 1832, the contagion has obtained such a foothold in Europe as it now has.

Sooner or later, it is sure to come, and we cannot tell how soon.

It is not probable, however, that it will reach us before next spring, and we may pretty safely count on some months yet in which to push our preparations to meet it and to resist its advance.

I undertake to say, as a sanitary official of nearly twenty-five years' experience in the practical administration of sanitary matters in city, State, and nation, and after more than a third of a century of study and observation of the disease, beginning in 1850—that Asiatic cholera may be practically excluded from the United States; that it is pre-eminently a quarantinable disease; that, with a judicious employment of agencies which have already been tested, Asiatic cholera may be quite as successfully dealt with in this country as small-pox, and probably more so than yellow fever.

Whether cholera shall be excluded—whether the means and agencies necessary to deal with it shall be supplied—are questions which the public must answer through their representatives in Congress, in State legislatures, and in their municipal councils.

Unlike the virus of small-pox, unlike the poison of yellow fever, the morbific potency of the cause of Asiatic cholera—whatever that cause may be—is sharply limited as to duration. Failing to find suitable conditions for its growth and reproduction it *dies out*.

No single case of cholera, no one shipload of cases has ever yet sufficed to establish an epidemic of Asiatic cholera on this continent. It has only been after repeated importations of the contagium in the persons of thousands of immigrants and in their infected baggage and household goods, that it has effected a lodgment, and has reproduced itself and multiplied into an active epidemic agency.

It will not do, however, to construe this tardy establishment of the contagium into an excuse for delaying measures of preparation—neither those for its exclusion, nor those for its limitation and suppression, should we fail to exclude it. Cholera is a capricious disease, and the history of its various pandemic extensions throughout the Old World affords occasional instances of a single introduction sufficing to inaugurate an epidemic. Fortunately, the same conditions do not, generally, obtain with us, except in a few localities. Populations

are not so dense, nor are dwellings so saturated with crowd-poison, nor is the soil so thoroughly polluted by long occupancy. Where these evils exist they should be remedied forthwith to as great an extent as practicable, in order that, among other good results, the conditions favorable for the growth and multiplication of the cholera-poison may be destroyed or limited.

With the necessary agencies of an effective quarantine provided in due season, it would not require any very great degree of courage to promise the practical exclusion of the disease.

These necessary agencies may be thus stated in their natural order of sequence:

First.—Timely and trustworthy information of the existence of the disease in countries and at ports having commercial relations with our own, including telegraphic advices of the departure of vessels from such ports for ports in this country. Section 1752 of the Revised Statutes of the United States gives the President authority to use all diplomatic and consular officers for "the communication of information . . . conducive to the public interests;" and instructions have already been issued under this authority.

To properly utilize this information, in fact, in order to fully secure the information, there needs to be—

Second.—A National health organization, representing the natural sanitary divisions of the country; endowed with adequate authority; supplied with means commensurate with the duties imposed upon it; and with the power to call upon any other branch of the public service of the United States for legitimate assistance and co-operation. With some modifications the present National Board of Health would satisfactorily meet this indication.

Under this National health organization there should be extended and perfected—

Third.—The system of Refuge Stations projected by the National Board of Health. With two or three exceptions, no port in the United States has adequate facilities for the proper administration of quarantine. Such a system as was inaugurated by the National Board of Health, and which is the only quarantine contemplated in these remarks, involves the removal of an infected or suspected vessel out of the track of

commerce; the segregation of her sick from the well; the proper care and shelter of both these classes; the necessary disinfection of infected cargo, and the purification of the vessel; and the release of vessel, cargo, and persons, so soon as they have been rendered safe and free from the danger of communicating disease.

This is very different from a mere quarantine of detention. It is the American quarantine of sanitation, a common-sense quarantine, which aims to prevent the introduction and extension of contagion, not by merely arresting it at a given point and there leaving sick and well at its mercy until, the susceptible material having become exhausted, no more cases of the given disease occur; but by removing the susceptible at once from its influence, and then destroying it and the conditions necessary for its existence by scientific methods of disinfection and purification.

To do this, however, requires a quarantine plant and facilities far beyond the means of any but the largest ports, supported either by abundant quarantine fees or by adequate appropriations from the State or municipality. But cholera may obtain access at a small port as well as at a large one, and hence the necessity for the Refuge Stations above indicated.

Under the system here outlined the departure of a vessel from a cholera-infected port would be at once cabled to the National health officer; the authority at the port of destination would be duly notified; pilots for such port would be ordered to take the vessel to the nearest Refuge Station; and at such station, under the charge of a National officer, and at the expense of the National Government, she would be so treated as to make it impossible that she could land cholera contagium in our midst.

But something more than this is needed in order to perfect the sanitary defence of the whole country. For this we must have co-operation and concert of action. We must devise a plan whereby the limited and individual powers of communities and States may supplement each other and act harmoniously and efficiently for the common welfare. In the exercise of its police powers—upon which all its sanitary laws and ordinances are founded—the municipality is confined within its

own limits, or, for certain purposes, to a short distance beyond. The power of the State is in like manner limited by its own boundary lines.

In the absence of a National health organization, with power to act without reference to State lines and with resources to meet every emergency, the best we can now do is to form an organization of all those clothed with sanitary power and authority, both State and municipal—an organization which shall give effect to the principle that, in sanitary matters, the interests of one are the interests of all; that we are each our brother's keeper in whatever pertains to the prevention of the introduction and spread of epidemic contagium. Such an organization as the Sanitary Council of the Mississippi Valley, supervising—and if need be maintaining—a system of sanitary surveillance similar to the River and Rail Inspection Service in the Valley, and the Immigrant-Inspection Service of the recent small-pox epidemic, will be of great value in a two-fold manner. It will enable State and municipal authorities to aid each other and to make their rules and regulations substantially uniform, and thereby to secure the co-operation and assistance of transportation companies and other commercial interests, whose business success depends so largely on freedom from unnecessary interruption or conflicting and changing restrictions. It will be of positive sanitary value in the moral pressure exerted on the individual agents of travel and traffic.

Here in the Valley, a great improvement in the sanitary conditions of steamboats, barges, and river craft, and, to a minor degree, in the care of railway cars, depots and out-buildings, followed the knowledge that the detention for inspection depended upon the experience of the inspector with regard to the particular boat or line. In the same way the conditions of immigrant travel were sensibly improved by the Immigrant-Inspection Service, not only on our railroads, but on the ocean steamers themselves. Its effects were also manifested in the administration of the seaboard quarantines, to which the Service was a direct help in securing a prompter and more general compliance with the quarantine requirements of the different ports.

This latter point is one of supreme importance to the interior. Illinois, for example, is as much interested in maritime

quarantines as are communities bordering upon the Atlantic and the Gulf of Mexico. During my own official experience the State has repeatedly suffered from the laches and inefficiency of their administration. Her sanitary interests are protected or endangered through them along the whole line from the mouth of the St. Lawrence to the mouth of the Mississippi, and even to the Rio Grande. Means of communication and intercourse are now so multiplied that time and space—in respect to contagious diseases—are practically annihilated; and the methods which secured protection for the interior twenty years ago are, to a great extent, valueless to-day. In 1873 for example, there were outbreaks of epidemic cholera at Carthage, O., Kandiyohi County, Minn., and Yankton, Dak., caused by cholera poison packed up in the household effects of emigrants in Holland, Sweden, and Russia, respectively; these emigrants sailed from healthy ports, in healthy vessels, and were subjected to the usual sanitary requirements of the period. They passed through New York and all the intermediate territory without injury to the public health. But when their infected goods were unpacked in the interior of the continent they liberated the poison which gave rise to the local outbreaks.

Sooner or later the National government will be compelled not only to assume supervision of exterior quarantines, but to provide for a permanent system of co-operation with State and local governments in the administration of inter-State sanitation; in order, on the one hand, to prevent the introduction of exotic epidemic diseases, and, on the other, to prevent their spread from State to State along the great intra-National highways of travel and commerce. This is a National duty. It is one that the National Government only can adequately discharge, and its expense is, equitably, one which should be defrayed from the National treasury.

Just now this means more than the good to be found in the saving of human life and in avoiding the suffering and misery, the ruined homes and desolated families which an epidemic always leaves in its track. It means the prevention of panic; it means the prevention of the interruption of trade and commerce; it means the prevention of the loss of millions of dollars, all of which would inevitably result from an epidemic of

Asiatic cholera in this country. Already the disease has cost Southern Europe not less than a hundred million dollars—six million dollars up to October 1st in trying to prevent its spread in Italy alone, with a loss of four million dollars even in the month of August, before the disease had effected a serious foot-hold; and now it is announced that the decrease of the national revenues of France has been materially aggravated by the reduction of receipts from railways, caused by the cessation of travel consequent upon the prevalence of the cholera epidemic. And yet Europe is only upon the threshold of this epidemic, if we may judge from the past.

Shall we be warned in time, or shall we wait until the pestilence has landed and obtained a foothold? A single outbreak —possibly a single case—of Asiatic cholera in New York, or Chicago, or St. Louis, or New Orleans, in our present condition, would cost the country millions of dollars, even though no epidemic spread should result.* With a perfectly feasible quarantine system, whose entire cost would not be a tithe of this sum, the chances of that single case may be made exceedingly remote. With an adequate sanitary organization—embracing within its scope the National authority, the State and the municipal, each in its respective sphere—not one case, nor one hundred, could establish an epidemic.

Such an organization of the sanitary defences would inspire public confidence and prevent panic in the face of real danger —and panic is one of the worst complications of a cholera epidemic, as fear is one of the most potent predisposing causes of the disease.

Congress must be urged to reorganize and rehabilitate the National Board of Health, or to provide an efficient substitute —one clothed with increased power and supplied with ample funds to maintain an effective system of modern sanitary quarantine for the exterior; to maintain an interior sanitary inspection service for the great highways of travel by land and water; and to give judicious co-operation and substantial assistance to States and municipalities in preventing the introduction

* In 1879 the report of a single case of yellow fever in the South caused a shrinkage in the provision market, in Chicago alone, which amounted to a million of dollars within twenty-four hours.

of epidemic diseases into one State from another, and in preventing their spread within the States themselves.

In States which now have no boards of health, or whose boards are not vested with the necessary authority or provided with adequate resources, the people should be awakened to the necessities of the situation. Legislators should be thoroughly informed as to the facts, and urged to provide suitable legislation.

Information on sanitary matters should be widely diffused to this end, and also to the end that, if an epidemic should come, we may not have to encounter the obstacles which ignorance is always ready to put in the way of what it does not understand.

These are matters which may profitably occupy much of our attention for the next two months; and I would suggest that when this meeting of the Conference adjourn it be to meet again in Washington early in December, for the purpose of conferring with the President, the proper Cabinet officers and the committees of the Senate and House as to the legislation which should be asked for at the next session of Congress. To this meeting I think not only should representatives of State Boards of Health be invited, but also all quarantine officers and the health authorities of the large cities, as well as those of the Dominion of Canada. I would also suggest that quarantine officers and those who are responsible for the local sanitation of towns, cities, and States should be requested to come prepared to give all necessary information concerning the quarantine and sanitary affairs of their respective ports and localities.

Dr. Smart, in his paper, set forth the facts on which the National Board of Health based its rules to prevent the introduction of cholera into this country, and to prevent its spread in case it did make its appearance. Science and experience, he said, had demonstrated the following facts: That cholera was caused by a specific germ; that the germ must reach the bowels in a living state; that the germ maintained its vitality and toxic property under many conditions, the most important being in the discharges from the bowels of the sick, in the soiled clothing of the sick, and in the beds they occupied, in the privies and cesspools which received the discharges, and in the soil and subsoil waters which became secondarily con-

taminated; and that the germ might be destroyed with no other interruption to travel and traffic than was needful to determine the likelihood of its presence and to apply the necessary measures for disinfection. Guided by those principles, the National Board of Health had organized a system of preventive measures, and experience had confirmed the Board's conviction that they composed the essential sanitary acts necessary to the complete suppression of cholera. They had prepared instructions for the guidance of American representatives in foreign parts with regard to informing the home Government of outbreaks of cholera, and organized an elaborate series of quarantine, precautionary, and preventive measures to be adopted in cases of ships arriving in American ports with infected persons on board, and had arranged for the disinfecting of railway cars running from an infected city, and for a thorough system of medical inspection of the passengers prior to starting on a journey from a town in which cholera might exist. Every precaution had been taken by the Board to effectively prevent the introduction of the disease at any unguarded point.

The discussion which followed the reading of the papers was led off by the Chairman. He said there had been some reflection in the papers on the inefficiency of some of the State Quarantine Boards. So far as it was morally and physically possible to prevent the introduction of cholera into the port of New York, everything was being well done at present. The officer who had charge of the matter was a State official, and provision was made by the State of New York for diseased persons and convalescent persons—whether suffering from cholera, small-pox, or ship fever. He thought there had been a thoughtless reflection on a class of public servants who were endeavoring to the best of their ability to prevent the introduction of disease into the country.

Dr. Lindsley, of Tennessee, said the people of his State were looking to the Conference for prompt action in the matter relating to the prevention of cholera. The State Board of Health of Tennessee were empowered to stop all communication with centres in which cases of cholera occurred, and they would do so within twenty-four hours after receiving notice of

any case of cholera existing in a city with which they had communication.

Dr. Covernton, who represents the Dominion of Canada in the Association, said filth was the gunpowder, and the germ the spark in case of a cholera epidemic. Filth should be kept cleared away by the intervention of the State Boards of Health, and then there would be no pabulum for the germ to work upon if it did come. It was of the utmost importance that there should be perfect accord between the European Governments and those of Canada and the United States.

On motion Drs. Baker, Walcot, Rauch, Bryce, and Herriell were appointed a committee to report on the means of defence to be relied on by our health authorities to prevent the importation of cholera into and its spread in this country, to report on Tuesday afternoon, and the Conference adjourned.

Tuesday's Session.

Meeting called to order by Mr. Brooks. Dr. Chancellor, of Maryland, read a paper entitled, "Can Epidemic Diseases be Prevented by Sanitary Cordons?" At the conclusion of the discussion of Dr. Chancellor's paper, Dr. Baker, chairman of the committee appointed at yesterday's session, presented the following report on the "Practical Work Required for the Prevention of Cholera in this Country."

"There are three essential factors to the prevalence of cholera in this country as an epidemic. (1) The importation of the disease by means of ships more or less directly from its only place of origin in India; (2) local unsanitary conditions favorable to the reception and development of the disease; (3) persons sick with the disease in some of its stages, or things infected by such sick persons to carry it from place to place. These three factors naturally suggest the methods of combating the disease, for which there is needed practical work, international, national and inter-State, State and local. So far as relates to State and local boards of health, their organization and activities are greater than ever before; but it must be admitted that after cholera has been introduced into a country, inland quarantines are not easily and successfully maintained, although efforts in this direction are then advisable.

In view of the threatened introduction of cholera into this country during the coming year, and the consequent immense waste of life and property values through derangements of commerce, trade, and productive industries, it is the sense of this Conference that the General Government should maintain such a national health service as shall, by rigid inspection at the port of embarkation, question the freedom from disease and infection of all persons and things from infected districts; and shall secure the surveillance of such persons and things while on shipboard, and, when necessary, detention at quarantine stations on this side for treatment and disinfection.

"In view of the present threatening aspect of Asiatic cholera, and the constant danger from other communicable diseases occurring at foreign ports having commercial relations with the United States, we urge upon Congress to provide for the appointment and maintenance at all such foreign ports where cholera, yellow fever, plague, small-pox, or scarlet fever exist, or are liable to exist, of medical officers of health, the same being either accredited consuls or attached to the consulates. The duties of these officers shall be: To give notice, by telegraph when practicable, of the existence or appearance of any of the above-named diseases to some constituted authority in this country; to give notice of the departure of any vessel known or suspected to be infected for any port in the United States, and, whenever requested by the master of any vessel about to load or leave for this country, to inspect thoroughly such vessel in all her parts, and also her cargo, her crew, and passengers, to use such cleansing and disinfection as he may deem necessary, and to satisfy himself that all persons about to sail are free from dangerous communicable diseases, are not recently from infected places, and are properly protected from small-pox, giving to her commander a certificate of inspection and of all precautionary measures taken. And it shall be the duty of the central authority in this country to promptly transmit intelligence of the existence of the above-mentioned disease at foreign ports and places, and of the departure of dangerous vessels for the United States and Canada, to all State and local health authorities in the country which may be interested in the same.

"We further recommend, in case of those foreign ports

which have no consular agents of this country, or no telegraphic communication with this country, and which are liable to transmit pestilence through commercial intercourse, that one or more medical officers be chosen to visit such ports as often as may be deemed necessary by the central health authority in this country, so as to give trustworthy information of the health and sanitary condition of these places.

"Inasmuch as the Dominion of Canada is equally interested with the United States in protecting itself and the United States from the importation of dangerous diseases, we suggest that Congress take such measures as will bring about concerted action with the Dominion and the British Government by which the consuls of this country or of England at foreign ports shall examine and take such action as they may deem effective, and notify the authorities of such government as has authority over any port to which any ship may sail in the United States or Canada, in order that such government may be in a position to take effective measures against the importation of these diseases. We are gratified that the authorities of the Dominion of Canada and the Province of Ontario have taken active steps toward protecting the people of Canada and indirectly those of the United States, by the adoption of extensive quarantine regulations. We feel, however, that with respect to those regulations regarding the landing of passengers from the mail steamers along the St. Lawrence, etc., further special regulations for the thorough disinfection of the baggage and effects of all passengers, cabin or steerage, as come from infected ports and places, should be carried out in a manner similar to that recommended by the National Board of Health. Believing that the importation of cholera into this country has usually attended the presence of immigrants from infected countries, we therefore recommend that all such immigrants be prevented from landing at our ports until such time as the danger of the introduction of cholera by them shall have passed.

"The inspection and quarantine service inaugurated by the National Board of Health, and set forth in the paper by Dr. Smart before this Conference, but which system is now inoperative for want of an appropriation by Congress, meets with our cordial approval. To enable these protective measures to be carried out, we recommend that Congress be urged in the

strongest terms to legislate on this subject at an early date in its coming session, and to appropriate such funds as may be needful. The expenses incident to the work which has to be performed at foreign ports should undoubtedly be borne by the National Government, and not by individual States or municipalities, for the benefits accruing therefrom are general and not restricted to localities, although some ports and cities on the coast may have a more immediate interest in the matter than others in the interior. It is probable, however, that this national protective work may not be sufficient.

"It will undoubtedly delay and lessen the chances of invasion, but it may not prevent invasion; the poison of the disease is subtle, and may effect an entrance into the country at some unguarded point. The funds necessary to the stamping out of the disease in a particular locality, and to the prevention of its spread to other localities, might in some instances be borne by the municipality or State affected; but should the disease occur in a locality which has failed or is unable to make provision for the occurrence, its spread to other cities and States would be imminent. The want of means at the infected point would be disastrous to many others. Congress has recognized the necessity for aid to State and local boards of health under similar conditions in the case of yellow fever. In 1879 the sum of $500,000 was appropriated and placed at the disposal of the National Board of Health; and the records show that of this sum $160,000 was employed in combating the epidemic that year. We therefore recommend that the influence of this Conference be used with the view of having appropriated by the National Legislature the sum of $500,000, to be used, or as much thereof as may be needful, in case of a cholera invasion, in stamping out the disease from the infected localities, and preventing its spread from State to State.

"The removal of local unsanitary conditions favorable to the development of cholera is the especial work of State and local boards of health. Much has been done already in some States, but much remains which should receive immediate attention. Where it can be done, State Sanitary Inspectors should be appointed to visit all towns and cities specially liable to the disease, to counsel with the local authorities as to the

best methods of prevention. This work should be vigorously prosecuted before the disease reaches our shores.

"The cause of cholera is contained in the discharges from persons affected by the disease, or in things infected by such discharges. Should the disease reach our shores, the first case, and after this the first case which reaches any given community, should be strictly isolated; all infected material from these, and from any subsequent cases, should be destroyed in such manner as to stamp out the disease. Intelligent sanitary precautions beforehand and scientific disinfection and treatment in the presence of the disease, should take the place of the necessary cruelties of a panic. In case any city or town is infected, the same principle of isolation should in general be applied to the city as to the infected individual; intercourse with other cities and places should be under sanitary supervision, substantially as set forth in the rules and regulations of the National Board of Health respecting the inspection of travellers, disinfection of effects, vehicles, etc.

"Health officers and inspectors appointed by State or provincial boards of health, should, in addition to other sanitary work, see that the localities have set apart, erected, or planned to be set apart, or erected, structures which shall possess the sanitary requirements of an isolation hospital. But as regards all necessary work by local boards of health, most State and provincial boards of health have printed and issued documents which give ample instruction.

"Your committee recommend that when this Conference adjourns it be to meet in Washington, D. C., the second Wednesday in December next, and that the Secretary of this Conference be directed to invite the attendance at that time of the quarantine officers and the health officers of the principal cities in the United States and Canada, and that all delegates to that meeting be prepared to report the sanitary status of their State or locality, and what steps have been taken to improve the same and to prevent the introduction of disease."

After full discussion the report was adopted with but one dissenting voice, and the Conference adjourned to report as a body, and by States, to the Association Wednesday afternoon.

The report of the Conference was made by the Secretary as follows:

"There has been a growing feeling with some of the leading practical sanitarians of this country, for several years, that alongside of the American Public Health Association, and working in perfect harmony and conjunction with that body, there was needed some sort of organization by which the health officials intrusted with the practical administration of the health laws in the various States of this Union might be brought together for exchange of views and comparison of methods in the line of their work, and to secure co-operation and concert of action between the States on all questions of inter-State quarantine, and in the prevention and management of epidemics of too great magnitude to be dealt with by the health authorities of the individual States. This course seemed the more needful in the last few years in consequence of the failure of the National Government to maintain an efficient health service. During the last meeting of this Association, in Detroit, arrangements were made for calling a meeting of representatives from all the State boards of health in the Union, at Washington, D. C., for conference on this subject. Of the twenty-seven State boards of health, eighteen sent representatives to this meeting, and after mature deliberation 'The National Conference of State Boards of Health' was organized, and Hon. Erastus Brooks, of New York, was elected Chairman, Dr. J. N. McCormack was elected Secretary, and arrangements were perfected for the first annual meeting to be held in this city during the present week.

"On the outbreak of cholera during the past summer, and at the request of several State boards, the Chairman called a meeting at Washington for August 7th, especially to consider the means by which cholera might be combated. The apparent subsidence of the disease in Europe and other reasons induced the postponement of the meeting until this time. At the meeting in this city five other State boards became members of the Conference, giving representation from twenty-three of the twenty-seven organized boards in the Union as well as representatives from the Board of Health of the Dominion of Canada and of the Provincial Board of Ontario. The Conference has confined its work mainly so far to the considera-

tion of the cholera question, and after hearing able papers from various representatives on the subject they present their conclusions in the following report" (the report of the committee above given).

The report on cholera was ably discussed and unanimously adopted by the Association, and its Secretary was instructed to have the same printed and a copy sent to the President of the United States and to each Senator and Representative in Congress. Each State board, through its Secretary, then reported to the Association the progress and methods of the work being done in their respective States.

The Conference adjourned to meet in Washington the second Wednesday in December next.

. NATIONAL BOARD OF HEALTH.—The following resolutions, which THE SANITARIAN heartily indorses, were introduced in the Chicago Medical Society by the Secretary, L. H. Montgomery, M.D., at the meeting September 15, 1884, and unanimously adopted :

" *Whereas*, From present reports and indications in foreign countries, cholera and yellow fever, both pestilential diseases, prevail, and as the latter especially is always assuming a threatening attitude toward us and is not conducive to our national prosperity nor to public health, and should, if possible, be averted with earnest and efficient sanitary measures, and

" *Whereas*, Cholera may make its appearance on this continent ere another twelve months elapse, and should likewise, if possible, be averted or restricted to the narrowest limits, therefore

" *Resolved*, That it is the sense of the Chicago Medical Society to have that department of the Government relating to public health recognize the services of the able sanitarians constituting the National Board of Health, for the purpose of co operating with State, municipal, and other organizations of a similar kind, and that a committee consisting of seven (7) members of this Society be appointed by the Chair to draft suitable resolutions in behalf of said National Board.

" *Resolved*, Furthermore, that this committee present said resolutions to the Congress of the United States, memorializing that body to make a sufficient appropriation for the purpose of said Board for scientific investigation in the prevention and restriction of epidemic, preventable, and pestilential diseases."

THE RELATION BETWEEN UNDERGROUND SEWERAGE AND FILTH DISEASES.*

By S. S. HERRICK, M.D.,
Secretary of State Board of Health of Louisiana.

THE accompanying statement has been prepared from data kindly furnished by medical men (chiefly health officers), in the various cities named, and has been delayed one year on account of prolonged illness. It was hoped that the investigation would throw clear light upon the question indicated by the title; but, this having obviously failed, it only remains to elicit from the figures such instruction as they may afford on other points.

The difficulties besetting this research are greater than would appear to the casual inquirer. In the first place, he who would estimate the effect of a given cause upon the public health, should know the whole number of cases of disease which are chargeable to it; but we get a record of the fatal cases only. Of the diarrhœal diseases generally, a vast majority of the cases recover, and an actual majority of typhoid fever and diphtheria; and the severity of all classes varies greatly in different seasons. Again, diagnosis is a very uncertain element in the calculation, being largely dependent on the "personal equation" of the medical attendant. Each "personal equation" would be a severe study to an intimate acquaintance, and a thousand of them to a stranger would be a hopeless task. At the best, therefore, only a distant approach to a correct result could be hoped in a given locality; but the chances are somewhat improved, when we can group a considerable number together, with the prospect that errors may, to an uncertain extent, correct each other. It was in this view that averages of single years and of three years together have been made in the table, by gathering the cities in groups of

* Read before American Public Health Association, St. Louis, Mo., October 17, 1884.

ten, nineteen, and nine, according to the extent of their sewerage system.

To review the consolidation, the first group embraces those cities in which the sewerage system includes the population varying from three-fourths up to the whole; the second group has an enjoyment of sewerage varying from one-twentieth of the population to two-thirds inclusive; the third has no sewerage at all. Designating them as (1), (2), and (3), and observing that the mortality is calculated as so many per one thousand, according to the census of 1880, we find the following for the three years, 1880, 1881, and 1882, taken together:

Typhoid fever: (1), .51; (2), .73; (3), .77.

Diphtheria: (1), .95; (2), .98; (3), .58.

Diarrhœal diseases: (1), 2.67; (2), 1.93; (3), 2.48.

The apparent conclusion from these figures is as follows: 1. Sewerage is favorable, as regards typhoid fever. 2. As regards diphtheria, sewerage, complete or partial in any degree, is about alike, but each much more unfavorable than none at all. 3. As regards diarrhœal diseases, the best condition is partial sewerage, complete sewerage and none at all being nearly alike in effect!

In the writer's opinion, a reasonable conclusion would be, that underground sewerage is not an important factor either in the causation or the prevention of filth diseases. With regard to typhoid fever and diphtheria, acknowledged as infectious, suitable methods of disinfection are admittedly so necessary and so effective as to render sewerage indifferent; and the same might be said of the diarrhœal diseases, so far as their infectious character goes.

These inferences are drawn from figures in connection with sewerage systems as actually administered; but doubtless improvements might be made which would give better results. Evidence on this point is furnished by the new, nearly complete and separate system of Memphis, where the sewage pipes are small and are washed out twice daily; and where we find a mortality from typhoid fever and diphtheria lower than the average in sewered cities, along with a remarkably high rate from diarrhœal diseases. But, on any plan, new works would show more favorably than the same would after joints and connections have begun to loosen and filth become permanently

adherent to interior surfaces. The only security from the reflux of sewer gases into inhabited apartments lies in frequent and skilled inspection, such as no ordinary health organization could afford to maintain and the average landlord would never give to his tenants. Therefore, while theoretically a decided advantage might be conceded to underground sewerage, we can easily account for practical results as we find them. Besides, other methods of disposing of fæcal matters are susceptible of great improvement, attainable with a supervision requiring less skill and intelligence than that demanded by a complex sewerage system.

Therefore, the conclusion of the whole matter would be, that the advantages of underground sewerage lie in a questionable economy and an undisputed convenience and decency in removing filth from urban habitations, without decided sanitary significance.

CANNED GOODS.

WE have received the following communication, together with several extracts from the newspaper referred to, on the subject at issue, and sincerely hope that the attention it has attracted will result in the utmost possible care on the part of both producers and consumers, in the interest of the public health. With this result, Dr. Johnson's paper before the Medico-Legal Society, published in THE SANITARIAN for June last, which has attracted such widespread attention, will have been the means of accomplishing much good, however questionable the cases he reported :

NEW YORK, October 18, 1884.

To the Editor of THE SANITARIAN :

Occasional instances of alleged poisoning from the use of canned goods have been reported, and, furnishing as they do the basis for attractive news items, have in many cases been given wide publicity by the press, with the effect of needlessly frightening many consumers of canned goods and injuring this great and growing industry. Investigation of some of these alleged poisoning cases has shown that they were either wholly unfounded or greatly exaggerated, and the object of this communication is to ask if you will not in the future kindly investi

gate cases of alleged poisoning and see whether the trouble may not be attributed with equal justice to other causes. Canned goods, being hermetically sealed while fresh at the sources of supply, we believe are in most cases fresher, more wholesome and palatable, than many so-called fresh articles which are exposed for considerable periods of time in city markets, and that there are fewer cases of bad effects from the consumption of canned goods than from the consumption of a similar amount of food not canned. The average annual production is now estimated to be upward of five hundred millions of tins, or about ten for every man, woman, and child in the United States. It has developed into a national industry which furnishes a much-needed supply of anti-scorbutic food during the winter months, and in many localities preserved provisions have become a necessity. If there are any unwholesome goods packed, reputable packers desire to co-operate with the press and the medical profession to prohibit such packing. But in view of the tendency to sensationalism and alarm on the part of consumers and the manifest damage occasioned thereby, we ask you to thoroughly investigate the facts and be sure that sickness may not justly be attributed to other food or causes before expressing an opinion in any case which may come under your notice. The result in the inclosed memorandum of cases which were investigated by *The American Grocer* newspaper illustrates the tendency toward exaggeration in such cases. We have established a bureau of information for the packers of the United States, and desire all information which will tend to the improvement of quality in canned goods, and will be glad if you can at any time communicate any facts which will tend to this result.

Respectfully, etc.,

DAVID HUNT,
E. C. HAZARD,
A. DUNCAN,
ALEX. WILEY,
HENRY SONN,

Canned Goods Committee, N. Y. Mercantile Exchange.

POPULAR COOKERY.

WE wonder if mankind taken as a body, do care to have nice things to eat? Educated men in Europe, accustomed to comfort and solicitous for health, will open their eyes at the question; but the answer to it is by no means past doubt. That the majority of human beings, or possibly all, like certain things to eat better than certain other things, may, of course, be true, just as the same is true of all the animals man has closely observed. A dog will follow liver for miles; a cat, for all its dislike of wet feet, will whine with eagerness if it smells fish; and a horse never forgets the giver of a long bit of sugarcane. Man may have instinctive preferences of the same description. He almost certainly has one which is a little odd, upon the Darwinian theory, for it occasions him enormous inconvenience and expense. Whether from some instinct preservative of health, or from a mere taste, he distinctly prefers hot food; and to gratify this fancy puts himself and his womankind all over the world to the trouble of daily cooking. Even "bread" is eaten hot by the majority of mankind—the use of bread which will keep well being a European particularity; and very few races habitually eat anything cold, except when hot food is unattainable or expensive. They like their rice, or their millet, or their wheat-cakes, or their vegetables, or their meat just as it comes from the fire. As this practice involves immense additional expenditure for firing—which in most places is one of the heavy burdens on the poor—and the loss of at least six hours' labor a week, this of itself might be held to prove that a taste for pleasant food is universal. Perhaps it is; but except in this one particular it is, we are convinced, neither deep nor widespread. Women are careless about eating everywhere; and the millions of laboring men find food so difficult to procure, that when they have obtained enough they are content, even if the meal is a little hard to eat. If it were not so, they would not have left an art so important so entirely to traditionary teaching, would have de-

veloped it in a way they have not done, and would have combined to secure pleasant meals in a style they carefully avoid. Among the immense majority of mankind each household cooks for itself, the work falling mainly on the wife, who is never taught except by her mother, and in the most traditional way. Improvement, if any is ever made, is exceedingly slow; and among some peoples, the English for one, popular cookery has probably retrograded, owing, in this instance, to the chasm of years which, so to speak, broke or interrupted the popular knowledge of the way to prepare meat. The women found flesh meat difficult to procure, and failed to hand down the needful instruction for its preparation. Half mankind at least knows nothing of boiling; of those who do know, another half will eat their vegetables in a sodden condition. Among the races which eat meat, only a limited percentage of persons try to make meat tender—we believe the flesh-eating Mongols form an exception to this rule, and some of the Polynesians—and among those who eat grain there is a distinct preference for the under-cooking alike of flour, rice, and millet, from a belief that such food is more fully satisfying. "I want to feel my 'tomach 'tiff," says one of Charles Reade's characters; and he exactly expressed the view of the indistinguishable millions. Separateness in cooking is pushed everywhere to preposterous limits, till it is probable that the preparation of food for mankind, which is the second great expense in feeding them, costs three times what it need, and till in many countries a proper supply of fuel is wholly beyond the reach of the poor. In Asia entire peoples burn dung, and even in Europe firing is never quite sufficient. And, finally, cooking does not advance. A new article of diet is occasionally added, like a potato, or a new condiment, like pepper; but it may be doubted if a European laborer's dinner is made a bit more palatable than the dinner of an Israelite was when the law-givers promulgated the curious notion that roast meat was more acceptable to the superior powers than meat boiled or stewed. Indeed, the way to make a kibab, which is known to the humblest in Asia, has been lost here; and only the gypsies are aware that meat covered with damp clay and placed among the hot ashes is not only delicious but much more nourishing than meat either baked or boiled. The natural way with a civilized people, if

they cared for nice food, would be to entrust the preparation of it to professionals, who would learn their trade by apprenticeship, and incessantly improve: but, except in Tuscany and Southern France, this is hardly done anywhere, though it ought to be the easiest of arrangements. It is only in the making of bread that men combine; and they have only just begun to do that in Europe, and do not do it in Asia, or, we believe, in most parts of North America—the Western woman making bread for her household as the Mexican woman makes her thin cakes. Yet the world everywhere combines in order to get its drinks, and the things it drinks gradually but quite steadily improve. Household brewing is, by the mercy of Providence, dying out; and nobody in Germany, America, or England would now swallow the horrible stuff which our ancestors called beer.

The truth is, man, though he cares to get food, and has an almost insane fear of hunger, which sometimes perverts his whole moral nature—as in the instance of the horrible toleration of shipwrecked sailors for cannibalism—is comparatively very indifferent to the preparation of his diet. He does not, as a rule, know even what is good for his health, and shortens his life with half-cooked flour which is deadly to the old, or kills off his children in heaps with half-swelled grain, though he sees in the latter case that they are distended to a degree which in his animals would seem to him dangerous or distressing. Every fifth child in India and Africa has a disease due exclusively to its diet. Man takes no trouble whatever to circulate knowledge on the subject; and, unless he is disgusted with an animal, as western Asiatics are with the pig, or contracts a horror such as Hindoos feel for eggs, seldom lays down inflexible laws on eating, and when he does, they are not sanitary laws. There are fifty lecturers in Europe and America on the abuse of alcohol for one on the abuse of food; and careful instruction on the comparative nutriment in different edibles, the value to health of thorough cooking, the immense utility of sugar to children, and the aid which certain diet would give to the formation of bone, would be probably thrown away. We wait to be corrected by experts, but we do not think that the rather feeble efforts made by the education department in this direction have elicited much popular response, though they are so strongly

approved by educated women. Even in London, if we understand Mrs. Davenport Hill's paper in *Macmillan*, the majority of those who profit by the cookery schools do it because they hope to be servants, and know that cooking may pay. Here and there an exception occurs—as in the case of the little girl whose father approved her cookery; but that seems to be the rule. It is, of course, very good that all candidates for service should learn cookery, and the mode of teaching seems to be perfect in every respect but one—the use of a range when the thing to learn is the use of a minute grate, or of hot ashes, or of a gypsy fire; but the true "people" will never learn cooking so. We must awaken an interest in the subject first; and that, we believe, can be done only by incessantly pressing the argument of health. The multitude everywhere care little what they eat so that they be but filled; but they do care to be healthy, and, above all, that their children should grow up "strong." If they only knew, as doctors and missionaries and experienced barrack sergeants could tell them, what food could be made to do for them, they would very soon alter their tone, and be clamorous for knowledge. Suppose, as a wild supposition, that they only knew what oatmeal and milk, or even oatmeal and gravy, would do for their future lives, what a difference it would make. They all know about it in animals, but will not apply it to themselves—do not believe, in fact, that diet can make any difference to human beings, except, of course, by being plentiful or inadequate. Yet when we tell them that weedy boys grow in barracks into powerful men because of their food; that in India hereditary native Christians often weigh one-fourth more than their kinsfolk because they eat a little meat; or that a tribe of Hindoos, unable to finish a profitable job of earth-work, resolved to suspend its caste laws, and eat meat, and in one month found its members strong enough for labor—they will believe, for they have heard those things before. It is the gain to be obtained from good food, not the enjoyment to be expected from it, which will ultimately attract the millions, and we wish the work of persuading them that good cooking can be made gainful could be begun. It can only be carried on by direct teaching, for cooking is one of the arts in which knowledge does not gradually filter down. There have always been good cooks, and the multitude round them

have always, nevertheless, put up with bad cooking. They either do not care, or are hopeless, and they will not grow properly discontented on the subject until they know that their strength depends mainly on their diet, and diet in an immense degree on certain ideas of cooking. Let the sedentary trades, for example, just learn what half-baked bread means—and much of the bread eaten in England is half-baked—and they will alter that particular evil within a month. Or let them just become aware what lentil meal (*dhal*, or "Revalenta Arabica") can do for the poorly fed, and they will start a new trade as profitable to shipowners as the trade in rice. Like the Irish when offered Indian corn, they reject the most heat-giving of all foods—a food with every good property at once of wheat and of alcohol—because they have not an idea how it should be cooked.—*The Spectator.*

TURKEY STUFFING.—Many great cooks make extra trouble in preparing a force-meat stuffing of veal, ham, bacon, onions, potatoes, or bread-crumbs, and all sorts of things. But the ordinary, old-fashioned stuffing for a turkey is generally liked the best. Take the soft part of good, light bread (not the crust), and do not wet it as is usually done, but rub it dry and fine, and work into it a piece of butter the size of an egg. Season with salt, pepper, and summer savory. Add to this a dozen or more oysters, whole, and it will be very fine. Some good cooks, who are ruled by taste, and not by books, add to a stuffing like the above large chestnuts, boiled. The chestnuts are put on a fire in a saucepan or spider to burst the skins; they are then boiled in very salt water or stock, then mixed with the stuffing whole. Serve with a chestnut sauce.

THE MILK FOOD prepared by the Anglo-Swiss Condensed Milk Company, as a useful addition to milk in the nourishment of infants from six to eight months of age, is equal to the well-known preparations of others, and indeed surpasses these in the greater amount of dextrine which it contains, as well as perhaps by its being easier of digestion, rivalling in this respect Sambuc's product, mentioned in our last annual report.—(From the Seventeenth Annual Report of the Jenner Hospital for Children, Berne, by PROFESSOR R. DEMME, 1880.)

ADULTERATION OF FOOD AND DRUGS.*

By BENNETT F. DAVENPORT, M.D.,
Food Inspector of Massachusetts.

THE subject of adulteration in food and drugs, although always of great importance, has become of still greater consequence in these days of ever-increasing sharpness of competition in trade. Very fortunate it is that such a large proportion of those prevalent in food affect more our pockets than they do our health, being rather either fraudulent or accidental than deleterious. In the case of drugs or medicines, however, all sophistications must be considered as deleterious or injurious to health.

Among the articles of food much subject to adulteration, that of milk is by far of the greatest importance, for it forms either the only, or else the principal, article of food consumed by a large portion of our infant population during those years that they are least able to withstand any tampering with their nourishment. Besides, it is one of the most important articles of food entering into the daily use of almost all other persons. This is an article of which the adulteration is most easy of execution, and which can be carried to a considerable degree without much liability of detection by the ordinary consumer.

The removal of cream and the addition of water are not of consequence simply as diminishing the amount of nutriment contained in any given quantity of milk, but they even affect the digestibility of that which remains. The reduction in the amount of the fat or cream present in a skim milk results in the formation of a tougher and coarser curd, and thus more unlike the fine soft curd which forms in a child's stomach which has fed upon its mother's richer milk. These differ about as much in digestibility as would a skim-milk cheese swallowed in large pieces from a cream cheese which had been

* Read before the American Public Health Association, St. Louis, October 16, 1884.

finely masticated. Then, too, the water added having for the most part to be used upon the sly, is not likely to be of as good a quality as it would be if it were added more openly. Even this last, as common good water is never absolutely pure, will, on being added to milk about a dozen hours before it is to be used, and the milk in the meantime being much shaken up by being carted about town, start such a change in a milk as will prevent it keeping sweet so long as it would if it had not been added, although all other circumstances remained the same. Furthermore, it is a well-known fact that milk not yet turned, but which is just upon the point of turning, and which it will immediately do upon being taken into a child's stomach, will create a greater disturbance in digestion than if it had been taken already absolutely turned sour. Thus the common adulterations of this article of food result in a double injury.

How to obtain a good supply of pure milk for a large city is a problem presenting considerable difficulty for its solution. A well-framed law, vigorously and impartially enforced by an inspector well backed by public opinion, and who has greater interest in his task than any salary can give, may accomplish it as nearly as practicable, but it requires ample means, proportionate to the great importance of the ends to be attained. The law must grant ample rights of inspection; that is, of access to and of taking of samples. The activity of inspection must be such as to make the chances of detection almost certain, and the punishment therefor must follow surely and speedily. The most effectual form of punishment thus far devised would seem to be that of publication in the local journals, whereby a greater penalty is inflicted through loss of trade than could well otherwise be imposed. For ease of conviction in cases of adulteration a fixed minimum limit of variability in salable milk is of the greatest importance. This, in the interest of the public health, should be drawn, not at the poorest milk ever known to have been obtained from a healthy cow, but it should be at the limits of a fairly good whole milk, which in the State of Massachusetts is fixed at thirteen per cent. of milk solids. Of these not less than three per cent. should be fat. The average milk of common dairies in Massachusetts has been found to contain about 13.75 per cent. of milk solids.

In large cities such as Boston, where there is a large demand for cream for use in coffee, etc., the topping of milk is the most common form of adulteration. The major part of the milk sold in stores was being thus treated when I first began to take charge of the milk of that city.

The simplest method of inspection of market milk with some reasonable degree of accuracy with which I am acquainted is by taking its specific gravity by a float, and percentage of fat by the optical test of Feser's lactoscope. This requires only about three minutes to do. Whole cow's milk at the temperature of 60° F. will be found to have a specific gravity of 1.029 to 1.033, and to have not less than 3.90 of fat by Feser's test. The limits of specific gravity will be raised 0.001 by a reduction of 10° F. in the temperature. A simply skimmed milk will have its specific gravity raised above these limits, while its fat will be considerably decreased. A simply watered unskimmed milk will have a specific gravity under 1.030, with a fat percentage somewhat under 3. If the specific gravity and the fat are both much under this, it has been skimmed as well as watered. If, however, the specific gravity is about 1.033, or a little over, while the fat is much decreased, but, however, after this milk has been skimmed, the specific gravity is then that of a skim milk, then it is a whole milk mixed with skim milk. This is the method of examination which I recommend to milk-dealers and consumers for their own use. The fat test will not vary more than one-fourth per cent. from the true weight in a whole milk, or more than one-half per cent. in a skim.

For chemists in their laboratories a slight modification of the method advised by Professor S. P. Sharples, of Boston, in his article upon the "Adulteration of Food" in the Public Health Supplement to the Fourth Annual Report of the Massachusetts State Board of Health, Lunacy, and Charity, is what I find is most advantageous. My modification is simply to evaporate the 5 grm. of milk in its flat-bottom platinum capsule in the free air upon the top of a water *oven*, completing it in a paraffine oven at the temperature of 105° C. To determine the fat by its removal by thrice boiling up the total solids in its capsule, while set again upon the copper oven with separate portions of a light petroleum naphtha, decanting off the naphtha and finally

washing off the capsule with the naphtha from a wash-bottle. This material being so cheap it can be used very freely, and moreover it has another advantage over ether, that of not dissolving out any of the sugar. With the facilities of my laboratory, determining the sugar by the polaroscope, each assistant can make a full analysis of about twenty-five samples of milk in eight working hours, so that by excluding all undoubted good samples of milk, as determined through their specific gravity and percentage of fat, and analyzing only the others, one person can examine quite a large number of samples of milk per day.

For any efficient inspection every dealer in milk of a city ought to have a sample of his milk examined at the least as often as once a month.

In Boston there are some three thousand dealers, of whom some six hundred are on milk-wagon routes. Some fifteen thousand to sixteen thousand of eight and a half quart cans of milk are brought into the city upon an average daily, that is to the value of about $4,000,000 a year.

Massachusetts is, I believe, the only State of our Union which has a special vinegar act. Ours is a very simple one, which besides requiring a vinegar to be really of the kind for which it is sold, also requires that it shall have an acidity equivalent to the presence of not less than five per cent. of absolute acetic acid in weight, and that cider vinegar shall have a solid residue of not less than one and a half per cent. of cider vinegar solids. This cider vinegar solid in the pure article is so free from soda as not to give any yellow tinge to the Bunsen gas-lamp flame when it is ignited in it. The reaction of this ignited residue upon turmeric paper furnishes the simplest manner of detecting the presence of the slightest amount of any free mineral acid in the vinegar. If there be any, it cannot give the brown alkaline stain, and if there be any arsenic present from a glucose made by sulphuric acid derived from pyrites, as the last spark glows through the carbonized mass the familiar garlic odor can be easily perceived. The percentage of acidity can be most easily determined by taking 6 grms. or in a commercial way 6 c.c. of vinegar, diluting it sufficiently with water to make it about white, adding a few drops of an alcoholic olution of phenol phthalein, and then running into it from a

burette a normal solution of soda until the pink color of the neutral point is reached. The number of cubic centimetres of soda solution consumed is the percentage of acidity of the vinegar. A pure cider vinegar gives only the slightest perceptible reaction for sulphates by barium, for chlorides by silver, or for lime by oxalate of ammonium. If more than this, it is not a pure article, while it should give a good precipitate for malic acid with a solution of subacetate of lead.

The examination for adulteration in drugs for the State of Massachusetts is conducted under an excellent statute based upon a draft for an act drawn by the National Board of Trade after the prize essay of G. W. Wigner, of London. Under this act, according to the rulings of our courts, the last revision of the United States Pharmacopœia is the standard for all the drugs and preparations mentioned therein.

During my first year's work for our State Board of Health I examined about three hundred samples of pharmacopœial drugs, and of them I found that about forty per cent. did not conform to its requirements. The drugs examined were principally such as were of the greatest importance as medicines, such as had been reported in recent pharmaceutical literature as wanting in strength, quality, or purity, and such as contained some costly ingredient, the omission or diminution in the quantity of which would greatly increase the profit of sales, and which from the difficulties of its detection would be likely to pass unchallenged.

Naturally in such a list the numerous preparations of opium and of cinchona bark formed a very important part. Of opium preparations that of the tincture is probably the most frequently used. Of this tincture I examined one hundred samples. Of these four only exceeded the maximum allowable strength of 1.60 per cent. morphine according to the 1880 Revision of the United States Pharmacopœia; while eighty-two fell below the minimum allowed of 1.20 per cent., forty-three only fell below the about 0.90 per cent. morphine, which according to the Revision of 1880 was the quantity required by the Revision of 1870. Their average strength was 0.965 per cent. morphine, the extreme being 0.336 and 1.87 per cent. In specific gravity, they varied from 0.921 to 0.997, with a mean of 0.953. This preparation is a striking example of the very great need of an enforced

uniform standard. Here was one sample of this very important and powerful drug very nearly six times as strong as another, to the great danger of the health and even the life of the public, about equally from the danger of either want of action or from over-action. In a case of emergency the too weak sample being the one used, the patient might die for want of the proper action, or if a patient or physician having become accustomed to the largely increased size of dose necessary with the weaker preparation, afterward takes or gives the stronger preparation in the same dose, again fatal results may happen from over-action. Thus from either cause the patient may die. There is a much greater apparent than real change in the strength of the laudanum made according to the 1880 Revision of the United States Pharmacopœia over that of 1870. An opium that will give the twelve per cent. morphine required by the 1880 process of assay will just about give the ten per cent. by the 1870 process, if it be conducted in the most favorable manner. So that the maximum required strength of powdered opium remains the same. In the tincture, however, there has been made the change from the about seven per cent. of the Revision of 1870 to the exact ten per cent. of the Revision of 1880, that is, the Revision of 1870 is about one-tenth weaker than that of 1880.

The proper method of assay of the tincture opii under the Revision of 1880 is to take 70 grms. of it and evaporate it to dryness at not above 85° C. as directed under powdered opium, and then to proceed exactly as directed for opium itself. The resulting weight in grammes multiplied by two gives the per cent. of morphine strength. This process of assay for opium is part of the required standard, for it is that the opium should contain not less than the twelve per cent. by the given method, while the absolute contents are not mentioned at all. The about fifty samples of powdered opium which I examined yielded on an average 13.34 per cent. morphine, even although several of them had evidently by intention been reduced by the addition of milk-sugar down to about the minimum allowable strength of twelve per cent. Only one of them exceeded the maximum of sixteen per cent., and none except the evidently reduced fell below twelve per cent.

Next most important to the opium preparations, if they do

not even excel them, are the preparations from cinchona bark. Of the simple cinchona alkaloid salts which I examined about twenty-five per cent. of them contained an excess of the cheaper alkaloids. There was no case of total substitution, however. Of the citrate of iron and quinine, out of forty samples thirty-three, or 82.5 per cent., fell below their proper weight of twelve per cent. quinine. One contained even as little as one-half per cent. The deficiencies were all of quantity rather than of quality of the quinine.

All the ready-made coated quinine pills of the Boston market have been examined. The best method to employ for the assay of quinine pills is to take, say, ten two-grain pills, dissolve them in a little water in a small capsule, breaking up with the aid of a small glass rod, add excess of caustic lime and dry thoroughly at 100° C. Remove the dry mass, and powder very finely and transfer to a tube for continuous percolation with strong ether of the United States Pharmacopœia. Although all alkaloids were practically extracted in six hours, I continued it for forty-eight. Then evaporate the ethereal extract obtained, after transferring to a beaker, to dryness at 100° C., and weigh the residue. It is needless to say that in these two transfers the utmost care should be taken that no material be lost, and therefore that the capsule, mortar, and extraction flask be thoroughly rinsed out with ether till no bitterness remain in them. The ratio of the anhydrous alkaloid obtained to what twenty grains of sulphate of quinine, even with the eight molecules of water allowed by the United States Pharmacopœia, should have yielded, gives the weight of quinine which the pill may have contained. This alkaloid should then be submitted to the United States Pharmacopœia test of quinine for identity and quality. This last is the Kerner's test for the presence of the cheaper cinchona alkaloids. It excludes more than one per cent. of quinidine or cinchonidine, or more than a trace of cinchona.

About two hundred samples of powdered pharmacopœial drugs were examined microscopically, and about twenty per cent. were found to contain foreign ingredient, or rather appeared so, for it is not common now as formerly that totally foreign substances are introduced, but it is the closely allied and inferior varieties, or damaged samples and trimmings of

the very same drug, that are used. Millers now study structural botany, and are becoming as expert as those whose duty it is to expose their improper practices. They have the excuse of the too well-known fact, that many druggists require as many pounds of the powdered drug to be returned from the mill as was sent, refusing to allow anything, or the proper amount, for the well-known inevitable loss incident to the necessary drying and subsequent powdering of the drug. And they say that in returning as much as was sent, no deceit is practised, for every one must know that something must have been added to make up for the loss incident to the powdering. The consuming public, however, are none the less deceived, although the trader may not have been.

The duty of examining food and drugs for adulteration has given rise to a new profession, that of public analysts or sanitary chemists. It would be very advantageous if they were united together here in America into some sort of an association equivalent to the Society of Public Analysts in Great Britain, to which some of us have the privilege to belong. It is only by uniformity of process that we can obtain results which are justly comparable with each other. It would add greatly to the public estimation of the calling if all the annalysts could agree in their results, when reporting upon the same article.

ADULTERATED FLOUR.—Where are the people to receive pure nourishment? Is it in the flour-barrel? No! The murderous speculators have attacked the very staff of life, and are to-day hoarding wealth upon the skeletons of the nation. And the practice is not of recent introduction.

In an interview with an old Beaver County miller he gave your correspondent a few facts that may prove interesting to many. He stated that what to-day is considered the best brands of flour by the unsuspecting bakers are the most dangerous and deceptive—the beautiful, fine white flour. Table etiquette is insulted by bread made of the natural flour as it comes from the burrs. It must not possess the natural golden tint of the cereal. Society demands white bread.

The miller referred to, who is one of the most reliable business men in the county, stated that he had been offered $15

for a receipt for adulterating flour, but had refused, which is sufficient evidence that the practice is universal.

Is this not a more vital question to the life of the nation than even the great tariff question itself? Let us implore, by every available means, our legislators to give us a State law that will protect the people from the foe so deadly—the adulteration of all kinds of food, and particularly flour.—*Correspondence Pittsburg Dispatch.*

SCIENTIFIC ASPECTS OF THE HEALTH EXHIBITION.

THE two scientific laboratories which have just been opened under the superintendence of Mr. Watson Cheyne and Professor Corfield must prove highly attractive to the medical profession and men of science generally. The biological laboratory, which has been arranged by Mr. Watson Cheyne, is on the top floor at the southern end of the City and Guilds Central Institute in the Exhibition Road.

This institute is now part of the Exhibition, and can be entered either from the Exhibition Road or from the eastern corridor of the Exhibition itself.

In his laboratory Mr. Cheyne has arranged a number of preparations intended to show the methods and the results of the work which is mainly associated with the names of Pasteur and Koch. The methods of preparing cultivating media, and the results of cultivation, are here shown, and many a visitor will be surprised to find that, although micrococci and bacilli are amongst the most minute of microscopic objects, their mode of growth in cultivating media is often characteristic and easily recognizable to the naked eye. The organisms associated with typhoid, glanders, pneumonia, erysipelas, osteomyelitis, anthrax, chicken cholera, and other zymotic diseases may all be seen in process of growth, as well as many other organisms which are not pathologic, and others which are pathologic to animals rather than to man. The diseases of the vegetable as well as of the animal kingdom will form the subject of demonstration in this room, and we may add that Mr. Cheyne purposes giving demonstrations, espe-

cially intended for members of the medical profession, on Thursday afternoons, at 4 o'clock. Professor Corfield's laboratory is on the ground floor, in a special building situate at the rear of the City and Guilds Institute. This laboratory will prove attractive to public analysts, medical officers of health, and chemists generally. The laboratory has been fitted with great completeness, and is furnished with all that is necessary for the most searching analytical processes. Assistants will always be on duty in these laboratories, and will be glad to offer any explanation; but we may add that Professor Corfield has arranged for a series of special demonstrations on Friday afternoons at 4 o'clock.

Those who are interested in questions of pure science should not fail to visit the French Court and inspect the material which has been sent from M. Pasteur's laboratory, and the various articles from the observatory of Mont Souris which have been contributed by M. Miquel.

In Pasteur's exhibit is shown, by means of drawings, etc., the work which this extraordinary man has done in connection with silkworm disease, anthrax, chicken cholera, and acetous fermentation.

The mode of sterilizing flasks and of conducting other processes connected with the investigation of organic germs is here objectively and instructively displayed. No one who is at all competent to observe can fail to be deeply impressed by the exhibit of M. Pasteur and with the work which is going on in Mr. Cheyne's laboratory.

Many a disbeliever in germs will have his scepticism either lessened or removed.—*London Lancet.*

MODERN ANTISEPTIC SURGERY.—Dr. Fraser C. Fuller, in the October number of *The American Journal of the Medical Sciences*, publishes an instructive article on antiseptic surgery, with illustrative cases, showing in detail the steps of an operation conducted on antiseptic principles.

CREMATION AS A SAFEGUARD AGAINST EPIDEMICS.*

By JOHN D. BEUGLESS, Chaplain, United States Navy.

THE late eminent Professor Hecker, pre-eminent as a medical historian, has left on record, repeated and emphasized, the opinion, which appears to have been with him a profound conviction, that epidemics of contagion are by no means unmitigated calamities. In support of this well-nigh startling proposition, the learned professor was wont to cite three noticeable facts:

First, that, as a rule, the victims of epidemics are taken from the non-producing classes—the wealthy and voluptuous on the one hand, and the shiftless and impoverished on the other. This he attributes to the impairment caused by drinking habits and associated licentiousness, and to the want in both these classes of a vigorous and healthy activity of body and mind, which leaves them without the tone and stamina necessary to meet and successfully resist disease. The taking off of these idlers, whether they be "wine-bibbers and gluttons" or worthless vagabonds, Dr. Hecker more than intimates, may not be wholly without advantages to the general public.

Second, this eminent sanitarian suggests that the general habits of cleanliness, moderation, and thrift begotten of these epidemics, and continuing with the people after any specific scourge has passed, go far toward compensating for whatever loss of life and property the visitation may have entailed.

Third, Professor Hecker maintains with much ingenuity, and with some show of plausibility, that great epidemics are followed by "epochs of development wherein the mental energies of mankind are exerted in every direction," and to this strange parentage he credits the birth of the genius which invented the printing-press, the military prowess which hurled back from the gates of Vienna the besieging Moslem hosts, the faith

* Read before the American Public Health Association, St. Louis, Mo., October 17, 1884.

and zeal which in Martin Luther achieved the Reformation, and the intelligent ambition which in Columbus discovered America; and it is a curious and noticeable coincidence that each of these historical events followed closely, in the country of its origin, an epidemic of what is known as "the sweating sickness"—an epidemic with whose awful ravages none of modern times compares; a scourge which, within a few brief weeks, numbered its victims by scores of thousands in each of several of the great capitals of Europe.

Notwithstanding all these compensations, real or imaginary, there will probably be found to-day no people of the world who will deliberately, and of choice, extend a hand of welcome to such a ghastly visitor.

"The pestilence that walketh in darkness and the destruction that wasteth at noonday" strike terror to the bravest hearts whenever and wherever they appear; and to "avoid it as we would a pestilence" is proverbially the strongest language we can command in which to express utter loathing and abhorrence.

How then shall we best avoid epidemics of contagion?

Others will discuss their etiology and discourse upon their means of transit and their doors of ingress. Quarantine regulations, disinfectants, systems of sewerage, and other sanitary regulations of the often-tried and ever-found-wanting character will each in turn claim our attention as they have done before, and from them all we will hope and trust for the best; for whatever else may come to our assistance and relief, all these agencies, used and directed with intelligence and zeal, will evermore be necessary for our safety. Despite all these, however, epidemics come; but fortunately, thanks to our isolated position and our not yet overcrowded population, less frequently and with less virulence to our own than to most other lands. There is no cordon of soldiery and no quarantine surveillance that can give us certain immunity from yellow fever or the cholera. It comes by the ordinary routes of commerce and of travel. It comes with our rich and valuable cargoes of merchandise, and with our returning tourists, our visitors and our immigrants. It comes, too, as the dust comes to the ship a thousand miles from land. It comes on the wings of the wind; and most literally it "walketh in darkness."

Finding a pestilence approaching, or upon us, what shall we do to protect ourselves against it? Shall we expect or hope to drive it out by arming our quarantine boats with bottles of chlorine, corrosive sublimate and carbolic acid, and firing them at the dread enemy? Experience has shown that it were almost as well to throw upon it a spray of eau-de-cologne or extract of sweet violets from an atomizer. Shall we fumigate? Burn, if you choose, upon the infected ship the delicious pastil with which the Turkish Pasha disinfects his harem, and you will at least have the fragrant perfume for your labor, but waste not your time in fumigating these carriers of disease. The question repeats itself with emphasis: What, then, shall we do to protect ourselves most thoroughly? Is there no sure way of destroying the destroyer before it has destroyed us?

In endeavoring to frame a satisfactory answer to this question, a layman may, perhaps, without pretending to have investigated the subject for himself, be permitted to take for granted, as established by modern scientific experiment and research, certain propositions relating to what is called "the germ theory" of the origin and mode of propagation of acute zymotic contagions, whether they be epidemic with us, as cholera, the plague, and yellow fever, or endemic, as small-pox, scarlet fever, and diphtheria. Whatever diversity of view there may be among investigators, as presented by Pasteur on the one side and Bastian on the other, as to whether or not there is a specific microbian organism which produces each particular type of zymotic contagion, they are quite agreed that such disease is always characterized by the presence of such microbia, and that these organisms are pre-eminently its most efficient carriers. Whether they belong to the etiology of the disease in its incipiency or are only pathological products thereof, their presence and their office as carriers cannot be successfully denied. And if pathological products only in their origin they certainly become etiological in the after-development and spread of the contagion.

Furthermore, it seems to be pretty well established that these microbia are specific, and characteristic in many varieties if not in every variety of zymosis.

Each, it would seem, is the carrier only of the particular

disease of which it is characteristic or in connection with which it has its habitat. Hence no one ever takes cholera from yellow fever, or small-pox from measles. The micrococcus diphthereticus never produces erysipelas or septicæmia. Each species of the contagium vivum has its own native habitat, its own particular range of capacity, and its own properties of resisting or enduring heat, cold, moisture, drouth, and exposure to hostile forces and conditions. Hence the imperfect success or total failure of efforts and experiments intended to destroy them by means of various disinfectants, as also by freezing, drowning, steaming, boiling, burying in the earth, and by desiccating. By some of these agencies a few of the less hardy may be destroyed, and doubtless all of some varieties, while in other cases, what proportion is not known, but certainly in the cases of bacteria characteristic of some of the most dreaded forms of pestilence, the best and most efficient of these disinfecting agents and conditions serve only to suspend activity until the microbes find a more favorable environment. In the case of most of them moisture and warmth seem to be the conditions favorable to their greatest development and activity, conditions which during the summer months are fulfilled to the last degree in our cesspools and sewers and in our church-yards and cemeteries, wherein our pernicious practice of earth-burial is storing vast magazines of these microbia to come forth in the forms of plague and pestilence whenever circumstances shall be found favorable. The tenacity of life of these bacteria is such that a burial in the earth for hundreds of years seems but to add to their potency for evil, as witness the cholera in London in 1854, the virulence of which was greatly aggravated by cutting a viaduct through an old burial-ground, and the plague in Modena in 1828, which resulted from disturbing the ground where victims of the plague had been buried three hundred years before.

There is one condition, however, readily produceable at almost any point where man has his abode, which no living organism has been found to withstand; and that condition is a dry heat of from three hundred to twelve hundred degrees Centigrade.

No disease germ, it is safe to say, has ever been known to

pass through the crematory fires and survive to propagate its species or to serve as the carrier of disease. The crematory is the only never-failing germicide.

And if we still hold to the old theory that these various forms of zymotic contagion, whether epidemic or endemic, are produced and propagated by chemico-molecular action, then it is equally true that the all-purifying fire is the one only known means by which that chemical action can be effectually and unfailingly arrested, and the poisonous compound reduced to its simple constituents and rendered innocuous.

Instead, therefore, of putting our beloved dead into a damp dark hole in the ground, there in the companionship of loathsome bacteria to putrefy, and thence to send forth the poisonous and deadly exhalations and emanations of the grave to seize upon the tenderly ministering survivors and drag them into the loathsome caverns where disease and death hold carnival, let us purify the material of their bodies from every defiling and corrupting agency, and translate them decorously and reverentially, but expeditiously, into the elements of all new and beauteous life.

Nor should we stop with the incineration of our own kindred dead. Let us perform the like gracious office for the bodies of all the victims of disease brought on ship-board into our ports, especially for all victims of ship fever, yellow fever, small-pox and cholera, and every other form of acute zymotic contagion. And let us consign to the same all-purifying fire whatever of dead matter has become the nidus or carrier of like disease.

Let our municipal authorities establish a crematory at every quarantine station and in connection with every public hospital and in every Potter's Field.

The Potter's Field of almost every city of the land is a disgrace to civilization and a pest-bed in the community; and many of the more reputable church-yards and cemeteries are little better.

Beautiful and park-like as they are without, within they are "full of rottenness and dead men's bones."

Let the National Government make like provisions in connection with the Army, Navy, and Marine hospitals and

asylums under its control. And let this influential Association memorialize our National, State, and Municipal Governments to this end.

But we should not stop here. All the garbage of our great cities, with much of the refuse that now goes into the sewers to lodge and fester under the wharves and on the shores of our else fair bays and rivers, should be cremated by an approved regenerative process, by means of which all the volatile products of the combustion may be reburned and purified. Thus may our land become indeed, as it should be, "the land of the living," no longer given over to be the heritage of disease and death.

INSOMNIA.

By J. K. Bandy, M.D., LL.D.

Insomnia, as is well recognized by all thoughtful practitioners, is a symptomatic indication of very different pathological states, and its successful and judicious treatment involves good judgment and no little experience. The first question is: Why does the patient not sleep? Is he suffering with organic cerebral disease? Has he anæmia or hyperæmia of the brain? Is the sleeplessness the result of some form of essential fever? Has indigestion or reflex disturbances, protean as they are in their manifestations, any connection with pathological underlying conditions? Have bad and intemperate habits in the abuse of narcotics, alcohol, tobacco, and other allied conditions aught to do in its production? Is insanity commencing? Does the history of the case permit the possibility of delirium tremens? Has the patient been subjected to excessive intellectual strain leading to congestive cerebral hyperæmia? Are there any of the well-known factors of vaso-motor paralysis present, thereby leading to cerebral fluxions from capillary relaxations superinduced by a paralysis of those branches of the great sympathetic system whose function is to control the contraction and dilation of the arteriola? All these questions and many more must be satisfactorily and intelligently answered, or insomnia cannot be scientifically treated. The physician can no more afford to lose sight of its

symptomatic import than he can in case of dropsy, cough, orthopnœa, palpitation, and numerous other cases where the symptom is not to be confounded with the disease.

Having carefully weighed and considered these questions, he must then carefully study the etiology of his case, as every fact and factor relating thereto is of great—nay, paramount—importance. The history of the case, sequence of symptoms, individual peculiarities and idiosyncrasies must, in this connection, rivet his attention. The history of alcoholism, of sexual excess, the opium habit, a recent debauch, would throw, for instance, a flood of light upon a case for which the physician could not be too grateful. Hence etiology is of extreme importance under such circumstances. To illustrate more fully and forcibly the influence of such direction of our observation under similar circumstances, for one moment let the reader reflect upon the important therapeutic distinctions depending upon the proper differential conclusions or diagnosis between a case of cerebral anæmia and cerebral hyperæmia resulting in obstinate insomnia. The etiology, under such circumstances, is the true philosophy of the situation.

If the case appertain to the anæmic variety, position alone, the cessation of all factors which would permit the confirmation of the anæmia and its perpetuation, must be thoroughly heeded. The cure of exhausting discharges, the arrestation of all hemorrhages and other drains upon the system, would suggest themselves to the minds of all skilful physicians, and a successful termination of the case would thus often occur without any recourse to direct medication for the insomnia. These general and leading remarks will enable us the better to review and appreciate some of the most approved methods for the treatment of this very troublesome and to some people quite alarming symptom. All who have had the experience in this direction know what a terrible ordeal it is to pitch and toss all night, hear every hour strike, and after, perhaps, a few snatches of feverish, fitful, and unrefreshing sleep, arise in the morning exhausted, unnerved, and incapacitated for the renewal of our daily duties. A repetition of many such nights must soon break the strongest constitution, as all our recuperative powers are renewed during sleep, which is the most potent physiological factor in renewing all the forces and vital tone of

the organism. Every case of insomnia must be a special study, to be considered entirely upon its own merits. There can be no common remedy for a symptom which originates in such antagonistic pathological conditions—some cases will yield to general hygienic directions, others to correction of some symptoms of indigestion, avoidance of late hours, reading late at night, and partaking of late suppers. Especially by stomachs growing old in service, failing to recollect they can no longer perpetuate the follies of their youth, of whose indiscretions they are now paying the penalty, and of whose many sins and outrages against the laws of health nature is now waking up to a terrible revenge. In some cases a stimulant is all that is needed. I now make many insane patients sleep with beer and alcohol, where formerly morphia, chloral, and the bromides were given, night after night. All familiar with the best treatment of the insane know that insomnia is one of the most obstinate and annoying symptoms the physicians have to fight. Yet, after an experience of twenty years' treatment of this form of disease, I repeat that, in some cases, malt and alcoholic beverages will succeed where all other forms of treatment will prove utterly unavailing. Twenty years ago, when I assumed charge of St. Vincent's Asylum, morphia was the narcotic par excellence; then came the bromides, hyoscyami, chloral, etc. Of hyoscyami I cannot speak in too high praise in certain forms of acute mania; the literature of this efficient and potent alkaloid is well known to the profession. Its hypodermic use must, however, be in well-selected cases, and very carefully administered as to the dose and frequency of repetition. I have found in cases of "acute delirious mania" the wet pack judiciously administered a useful agent, equalizing the temperature and by its sedative influence calming the patient into a refreshing slumber; of course, its rôle of usefulness is principally in cases where the temperature is greatly elevated. In many obscure cases we have to ring in the changes of various hypnotic remedies, and not infrequently we are forced into the domain of empirical treatment. Although I am generally opposed to proprietary remedies, justice to the profession and the claims of truth necessitate the avowal on my part that Battle & Co.'s "Bromida," composed of the best German chloral, bromide of po-

tassium, and the purest articles of hyoscyamus and cannabis indica that the market affords, is par excellence, I am constrained to say, the best hypnotic I have ever used. The small bulk of the dose, its concentration, purity, and general efficacy and convenience will win over any practitioner who impartially gives it a trial. Every day of my life I use it largely, and have recommended it to hundreds of my brother physicians. At St. Vincent's Asylum I made a test of it by giving each Sister in charge of a ward two bottles, one containing "Bromidia," the other an ordinary "house chloral mixture." After an impartial trial upon their part, without any previous knowledge of the contents of the bottles, a universal verdict was given in favor of "Bromidia." I was so prejudiced at first against the use of this article that a long time elapsed before I consented to the experiment; justice to the profession, however, requires the truth. Perhaps the alcoholic cases of insomnia are the most intractable, as when it comes to sleeplessness from that cause the case is apt to be a very difficult one to handle. No hypnotic treatment should be forced; the insomnia should be treated by ordinary doses of capsicum, chloral, and the bromides, remembering always that as the disease of which it is a symptom subsides, it will rapidly yield.

In cases of intellectual strain, all night-reading and studying must positively be interdicted. With an adherence to these simple plans of treatment, insomnia can usually be rapidly overcome, especially if the physician never loses sight of the fact that it is always a symptom of some important pathological state, which it is his duty to determine, and that it is never a disease.—*Medical Brief.*

DR. JULIUS WISE proposes to publish during the coming year a volume on "*Medical Wit, Humor, and Curiosities of Medicine*," and to this end requests the kindly aid of the profession by sending him any contributions to the subject. Witticisms and anecdotes of a humorous or curious nature—home and foreign, ancient and modern—will be gladly received and highly appreciated. Address 806 Olive Street, St. Louis, Mo.

"WHAT makes life dreary is the want of motive." A motive to use Esterbrook's pens is to become a good writer. All stationers furnish them.

EDITOR'S TABLE.

AMERICAN PUBLIC HEALTH ASSOCIATION, TWELFTH ANNUAL MEETING, ST. LOUIS, MO., OCTOBER 14–18, 1884. SECOND DAY'S PROCEEDINGS.

(Continued from October Number.)

SCHOOL HYGIENE.—After the usual miscellaneous business, the first paper of the morning session was by Dr. Stephen O. Richey, of Washington, "The Hygiene of Eyesight of School-children," which was read by Dr. Gihon. The paper said myopia was gradually increasing in America and some decided steps would have to be taken in the near future. It was just as bad to overstrain the eyes as, to dissipate in any way—by excess of eating or of drinking. We should not be profligate in study more than in anything else. A large portion of the children of this country are myopic, and in Hanover there is ninety-four per cent. of near-sightedness in the highest class. Agnew examined one thousand students and found that the ratio of myopia increased with the grades. At the Polytechnic Institute in Brooklyn the percentage was ten per cent. in the lowest class and sixteen per cent. in the highest. The tendency of eyes doing necessary work in school is toward myopia. Constant labor for five hours at a time, with poor light and bad position, with a slight uncorrected refraction, are some of the causes. A remedy was proposed not allowing the children to attend school until the period of second dentition, and the time apparently lost could easily be made up. The suggestion to examine the eyes of all school-children every six months was a good one, as progressive myopia could easily be avoided. The substitution of pen and paper for slate and pencil, of the slanting system of penmanship for the upright system, have all been discussed favorably and adversely. The author thought the greatest danger was not in writing, but in reading; the strain upon the eyes from reading the same kind of print for many hours was very bad.

The report of the "Committee on School Hygiene" next followed, Professor D. A. Sargeant, of Harvard University, being the author. Circulars should be sent to the school-teachers throughout the country, to obtain information on the subject of school hygiene. The report was accepted, and the committee increased to seven was allowed to stand.

"School Hygiene," by Dr. Felix Formento, of New Orleans, followed. Within the past twenty years philanthropists have made many efforts in the direction of improving school hygiene. Societies for the protection of children have been founded in all cities of America, and in France tracts are distributed, on the subject, to all persons registering the birth of a child. Many accidental deaths are thus prevented. The London schools, and most other European schools, are excellently organized, the appropriation for public instruction in England being about $30,000,000. In France much progress has been made in education since the revolution, 135,000,000 francs being devoted to primary education. In Italy and all other countries of Europe the same liberality prevails. In our country education is left to individual States, and national aid is not encouraged. In New York four and a half millions are annually spent, and the compulsory education law requires fourteen weeks' school attendance at least. But all these are of little avail without school hygiene. Is it not as necessary to teach your child the road to health as to fortune? The latter often depends upon the other. Physical development should precede mental, *mens sana in corpore sano*, was the correct motto. Vicious attitudes, crowded and badly ventilated rooms, poorly printed books, the system of overstudy, so much practised at present, produçe baneful effects, all of which might be avoided.

The school-house should be as small as possible, and removed from cemeteries, factories, and places of amusement and immorality. The school-yard should be as large as possible, a separate division for boys and girls, and there should not be more than forty pupils in each room. The room should be rectangular, ceilings high, windows tall, and heat should be moderated; the walls should be unpapered, the colors of ceiling and walls should be carefully studied; the flooring cemented or made of hard polished wood. Spitting should be absolutely

prohibited, as certain contagious diseases may thus be transmitted. Coughing should also be prevented, and the air should be constantly renewed at short intervals. The heating requires special attention, and closets are often foci of disease and should be carefully watched. Typhoid fever and diphtheria are often caused by uncleanliness in this respect. The return to school of children suffering from contagious diseases should be closely guarded; benches, desks, and other school furniture should occupy our closest attention. Twelve thousand nine hundred and sixty hours are occupied by children on school benches, and curvature of spine and myopia caused by wrong positions are common results. Benches should be washed, should be wide and have backs; lid of the desk should be movable and be inclined; hat-racks should not be indiscriminate for all the children. Proper attitudes for all children should be enforced; they should not be allowed to lean forward in reading or writing, and the object should be held at least twelve inches from the face. The child should sit squarely at the desk; early rising and early going to bed should be enjoined. Myopia is caused by badly printed books, faulty attitudes, long hours of study without intermission, and poor light. Calisthenics or gymnastics are now introduced in most private institutions and should be made compulsory in public schools, and both boys and girls should be made to participate. The exercises should take place as far as possible in the open air or in a well-ventilated room. A well-regulated system of gymnastics should never produce fatigue or exhaustion. The children should be taught elementary notions of hygiene. Few schools, however, possess chairs of hygiene, and in only eleven States are courses in hygiene given in schools or colleges. Yet hygiene is, perhaps, the most important of all sciences. Sanitary relations are looked upon as absurd and tyrannical, but unnecessarily so. Public lecturers on hygiene are not enough —the school-children must be given a hygienic knowledge and much disease might thereby be avoided. Hygiene should be taught in the primary schools in a concise manner, and afterward enlarged upon, and boys and girls should both be taught. Hygienic instruction should, if possible, be given by a medical instructor, but so many text-books are now in existence that the matter is much simplified. Special sanitary inspection of

all schools should be made at least twice a month, as schools may be the cause of much disease. Plans for school-buildings should be submitted to building inspectors, to see whether hygienic requirements have been followed. Medical inspectors should see that all the defects above mentioned are obviated. Monthly reports of the diseases among the school-children of every district should be submitted. School programme of study is the most important part of the question. The curriculi of primary schools are too complicated, school hours are too long without sufficient intermission, and the method of teaching is too abstract. Children cannot concentrate their attention for a long time on study, and the hours should be graded according to age. Excessive nervous sensibility should be avoided, especially in the young. Young children have an extraordinary facility for learning language without understanding the grammatical construction. The necessity of short intermissions is absolute in order to avoid cerebral lassitude. The number of school hours varies from twenty-eight to forty hours a week in different countries, and the best system is in Belgium, where the hours are regulated according to age. Home study is prohibited for the very young, and limited to a few hours for the older scholars. Cerebral lassitude can be relieved by proper sleep, a six-year-old child requiring at least ten hours' sleep. Recess, hot lunch, and gymnastic exercises, drawing, singing, and reading aloud, are all good exercises. Vacation of at least two weeks should be insisted upon for both pupils and teachers. The following table is similar to that used in Belgium, and has also been adopted recently in London :

Branches of study.	7 and 8 yrs.		9 and 10 yrs.		11 and 12 yrs.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
	⌐Hours.¬		⌐Hours.¬		⌐Hours.¬	
Mother tongue	5	5	9	8	10	9
Writing	3	3	3	3	3	3
History and Geography	1	1	2	2	2	2
Hygiene and Philosophy	1	1	2	2	2	2
Natural science	1	..	1	1	2	2
Arithmetic	3	2	3	2	3	2
Foreign language	3	3	3	3	3	3
Drawing	1	1	1	1	1	1
Singing	1	1	1	1	1	1
Needle-work	..	2	..	2	..	2
Gymnastics Recreation	5	5	5	5	5	5
Total hours per week, 5 days	24	24	30	30	32	32

Dr. E. S. Elder, Secretary of the State Board of Health of Indiana, read a paper on "The Sanitary Survey of the School-houses of Indiana." The system of Indiana is a pride to the people of that State, but it was found that many defects existed in the ten thousand school-houses of the State. Most of the school-houses were at least seven years old, and nearly seven-tenths of the school-house grounds were too small, being less than one acre. All thoughtful persons will see the necessity of having school-yards fenced, yet reports proved that forty-seven per cent. were not. Few were drained, underdraining was entirely wanting, and in fourteen per cent. large pools of stagnant water were allowed to accumulate. Thirty per cent. of the Indiana school-houses had no proper means of ventilation. Of the stoves in use for heating purposes seventeen per cent. were out of order, thus endangering the lives of the children. The stoves are generally in the centre of the room, and those near them suffer from excessive heat and those distant from excessive cold. Wrongly placed blackboards, bad windows, and impure water-supply are causes of great trouble. Twelve per cent. of school-houses depended on ditches for water-supply, and many of the wells were polluted with the bodies of dead animals, with drains from cesspools, graveyards, etc. Closets were also usually very badly arranged. Vaccination was a most important feature. No child should be allowed to enter a school without being successfully vaccinated, and in Indianapolis, where the rule is enforced, not a child was ever attacked by small-pox; but in twelve per cent. of the schools no law against contagious diseases was enforced. The requirement of doors swinging outward is seldom insisted upon, and in fact most country school-houses are flat, square boxes, located on land too poor to be used for farming or anything else. A few weeks ago a statement was made in New York that three thousand children in that State lost their lives on account of faulty hygiene. The education in hygiene cannot be effected by the present literary course, and in schools around universities even there was the most flagrant disregard of common requirements of health. The schools of Indiana are in a better hygienic condition than ever before, and, dark as is the picture presented by the survey, it is certain that the same state of affairs exists in all adjoining commonwealths. We

should endeavor to remedy the grosser evils first, and depend upon a pure hygiene for improved result.

Discussion followed by Dr. Raymond, Hon. Erastus Brooks, Drs. Thompson, Reed, Gihon, Bryce, Bell, Rev. Dr. Jacokes, Robert Moore, Esq., Drs. Conn, Bailey, Early, Fee, Devron, Green, and Hibberd—*all* evincing more or less knowledge of the various phases of school life and the perils of education in the United States, in default of more intelligent, systematic, and stricter sanitary supervision of public education.

FOODS.—"Cotton-seed Oil as Food," by Professor Charles E. Monroe, of the United States Naval Academy, Annapolis, Md., was read by Rev. Mr. Beugless, United States Navy. Considerable cotton-seed oil is, some people assert, frequently shipped to olive-oil countries, and then reshipped to this country as genuine olive-oil. The question of wholesomeness of cotton-seed oil is an important one, since the oil has wide-spread use under other names. The profits of the trade of cotton-seed oil among the poor are enormous, and the question of cotton-seed oil as an article of food should be examined.

Professor V. C. Vaughan, M.D., of the State Board of Health of Michigan, read a paper on the "Study of Poisonous Cheese." It is well known that cases of severe illness follow the eating of some cheese, especially in North Germany and America, but in France no such cases are found. In Michigan, within the last six months, over three hundred cases of cheese poisoning have been reported. The symptoms produced are dryness of throat, nausea, vomiting, diarrhœa, headache, and double vision—the same symptoms as gastro-intestinal poisoning. Cases of cheese poisoning are rarely fatal, six deaths in three hundred and forty-two cases occurring in Holland in 1874, a little over two per cent. Cheese that may be harmful to man may be eaten by lower animals without danger, and a cat once ate cheese that had poisoned thirty people, but the feline experienced no toxic effect. Coloring cheese with anato may be looked upon, perhaps, as a justifiable adulteration. Samples of cheese that had poisoned many people indicated the presence of acids, litmus-paper turning blue. The indications then were that the poison was caused by chemical acids and not by bacteria. Microscopic examination, however, revealed the presence of a spherical bacillus subtillis which did not affect a cat when injected

beneath the skin. Only poisonous cheese violently reddens litmus-paper, and this is a test easy of application. Every grocer should try the experiment when he cuts a new cheese. The following are the conclusions: 1. That toxic material in poisonous cheese is a compound soluble in alcohol. 2. The production of this poisonous material is due to the rapid growth of the bacillus subtillis. 3. The difference between poisonous and non-poisonous new cheese is one of degree rather than of nature.

"The Milk Supply of Large Cities," by J. Cheston Morris, M.D., of Philadelphia, was next read. The failure of the wheat crop would be less serious than if the milk-supply was cut off. Is it pure or foul? Does it carry with it the germs of diphtheria, scarlet fever, and of other diseases? These are the great questions. The profits are so small that the farmer skims the milk in order to get even with the middle-men. Milk kept for forty-eight hours is sold as new, and in four hundred thousand gallons of milk in New York, one hundred and twenty thousand were of water. Swill-fed cows are another cause of impure milk, but the detection of adulteration of milk is so difficult that it is almost impossible to punish the criminals. The young children are the ones who suffer most, and in New York 36.94 of the children under five years of age die annually. The largest number of these children die of diarrhœa, caused mostly by adulterated milk. The net rate was reduced to 36.73 in 1883, in New York, by the rigid inspection of milk. The adulterations are made by the middle-men, through whose hands the milk passes. In 1873 the proportion of the death of children was forty-eight per cent.; in 1883 it was reduced to forty per cent. Out of one thousand analyses of milk, two-thirds were deficient in cream. Investigation shows that the producers were honest, but poorly paid; the large shippers were not to blame, but the middle-men were the adulterators. At least one-fifth of the deaths of children under five years of age are directly traceable to bad milk, so that in 1882 at least twenty-five thousand lives could have been saved had milk been properly inspected. The death-list of children in St. Louis last year amounted to three thousand five hundred, and at least seven hundred of these could have been prevented. Dairy companies are good institutions, and the shipment in

quart glass jars from the farmer direct to the consumer, and the advanced price is gladly paid by the inhabitants of the city. The jars are carefully sealed and shipped to the city twenty in a box, for distribution. The milk must be clean, because the dirt would show in the glass jars. In the forty-gallon buckets used by milkmen, the filth that accumulates at the bottom is something terrible, but we cannot see it. This dirt must produce intestinal irritation. Each customer receives exactly a quart of milk with his exact proportion of cream. The system has been a great pecuniary success with the author, and with others in Paris and other cities. The method is very practical, and it is to be hoped that it will be adopted in other cities.

Dr. George M. Sternberg, United States Army, opened the informal discussion by approving the conclusions of Professor Vaughan on the poisonous cheese question.

Dr. B. F. Davenport, Milk Inspector of Boston, related the difficulties experienced by the authorities in that city in combating the sale of skim milk for whole milk.

Dr. S. W. Abbott, Boston, recounted the twenty-five cases of cheese poisoning reported in Boston, and said that he was happy that a simple means of detection had at last been found. The symptoms in the case were almost identical with those of cholera morbus.

Dr. J. H. Raymond, of Brooklyn, said he had met with two cases of cheese poisoning, and thought Dr. Vaughan's test a good one. He thought there were other causes at work in affecting infant mortality besides impure milk, varying temperature being among them. The dealers, and not the middlemen alone, were responsible for adulterations.

Dr. Reid, Ohio, found that the cases of cheese poisoning in his State were similar to those of persons sick from eating fermented fruit. The poisoned cheese was over-fermented and not pressed dry, and the speaker was not satisfied that bacteria are the cause of the poisoning. Fermentation, he thought, was at the bottom of the trouble.

Dr. Newton, of Paterson, N. J., gave a very interesting recital of the efforts of the health inspectors in his own State to secure good milk.

Dr. Comstock, of St. Louis, concluded the debate.

STATES' BOARDS OF HEALTH CONFERENCE.—The afternoon session was devoted to the Report of the Conference of the State Boards of Health, reported on other pages.

Dr. J. N. McCormack, Secretary of the Conference, made the following statement: "There has been a growing feeling with some of the leading practical sanitarians of this country, for several years, that alongside of the American Public Health Association, and working in perfect harmony and conjunction with that body, there was needed some sort of organization by which the health officials intrusted with the practical administration of the health laws in the various States of this Union might be brought together for exchange of views and comparison of methods in the line of this work, and to secure cooperation and concert of action between the States on all questions of inter-State quarantine and in the prevention and management of epidemics of too great a magnitude to be dealt with by the health authorities of the individual States. This course seemed the more needful in the last few years in consequence of the failure of the National Government to maintain a health service. During the last meeting of this Association, in Detroit, arrangements were made for calling a meeting of representatives from all the State boards of health in the Union, to meet at Washington, D. C., for conference on this subject. Of the twenty-seven State boards of health eighteen sent representatives to this meeting, and after mature deliberation it was

"'*Resolved*, That there should be a conference of executive officers and other representatives of State Boards of Health during the meetings of the American Public Health Association, and at other times if so desired. All questions shall be determined by vote by States, each State being entitled to one vote. The officers shall be a Chairman and a Secretary.'

"Hon. Erastus Brooks, of New York, was elected Chairman, and Dr. J. N. McCormack Secretary for the ensuing year, and after discussing various questions peculiar to the work of State boards the Conference adjourned to meet at this place.

"On the outbreak of cholera in Europe during the summer, and at the instance of several State boards, the chairman called a meeting at Washington for August 7th, especially to consider the means by which the importation of this disease

into and its spread in this country might be avoided. The apparent subsidence of the disease in Europe and other reasons induced the postponement of this meeting until this time. At the meeting in this city five other State boards became members of the Conference, giving representation from twenty-three of the twenty-eight organized boards in the Union, as well as representatives from the Provincial Board of Ontario and of the Dominion of Canada. The Conference has confined the work mainly, so far, to the consideration of the cholera question, and after hearing able papers from other representatives on the various aspects of this subject, has appointed a committee to put in succinct form its views as to the best and most practicable methods of combating this disease."

The report submitted stated that it was the sense of the Conference that the Government should establish quarantine at all sea-ports, the establishment and maintenance of health officers at foreign ports to give telegraphic warning of the approach of contagion or the departure of any vessel suspected of being infected. Intelligence of the approach of all epidemics should be promptly forwarded. It was further recommended that in those European ports where the United States had no consular agencies or in which there was no telegraph service, visiting health officers be appointed ; that co-operation with the Canadian authorities be encouraged ; and it was recommended that Congress legislate upon the subject at the coming session. The expenses of the establishment of stations should be borne by the National Government, as the whole country is interested in the exclusion of infection. Congress had recognized the necessity of national action in yellow fever epidemics, and in 1879 had appropriated $500,000 for the proper treatment of the plague. Cholera was communicated by persons and merchandise, and when any one was found suffering from the infection they should be isolated. The committee recommended an adjournment until the second Wednesday in December, and that the health authorities present be requested to communicate to the Conference the status of their respective districts.

The report of the Conference was accepted and discussion by States followed.

Hon. Erastus Brooks moved that the paper read from the Conference be printed and sent to the various Federal officers,

Senators, and Representatives. There were many theories of the causes of cholera, but people were a unit as to its effect. It was the work of the National Government to fight it, and of the State boards to aid in the fight. Public attention should therefore be called to the matter, in order to awaken the representatives of the States assembled at Washington. The American quarantine system was as unlike the European system as night was unlike day. The system of Europe was brutal, cold-blooded, unnatural, and unnecessary; the American system was merely the proper care of persons and goods, possibly infected. There ought to be no prejudice, therefore, against the quarantine system in vogue in the United States.

Mr. Brooks' motion was unanimously carried.

The report as adopted by Mr. Brooks' resolution will be found in full in *Tuesday's Session*, under National Conference of State Boards of Health, on other pages of this number.

Dr. Hibberd, Indiana, said there should be a revision of methods of cholera cures in use three years ago. He therefore offered the following resolution:

"*Whereas*, within a few years there has been a large increase in the knowledge of disinfectants, antiseptics, and germicides, both abstract and practical; and

"*Whereas*, it is important equally for practitioners of medicine, for boards of health, and for the general public, that the highest attainments of science in this department of sanitation should be formulated for easy reference by all who need it for practical application, and especially was this desirable in view of the probable visitation of cholera in the near future; therefore be it

"*Resolved* by the American Public Health Association that a committee be appointed to examine the subject of disinfectants, antiseptics, and germicides in their relations to preventive medicines and sanitation, and that said committee formulate a table of these agents for the information of those interested, the agents to be classified so far as may be deemed advisable according to their specific virtues, facility of application, and economy of use."

This resolution, having been discussed at some length, was referred under the rules to the Executive Committee.

"THE FOOD WE EAT, THE LIQUIDS WE DRINK, AND THE ADULTERATIONS WE SUBMIT TO," was the first paper of the evening session, a full abstract of which will appear in next number. "The Hygiene of Sailors Engaged in the Coasting Trade, and Especially the Hardship of the Chesapeake Oysterman," was the title of a long paper by Surgeon Walker Wyman, of the United States Marine Hospital Service, replete with information on the oyster trade of Chesapeake Bay, and descriptive of the lawless brutality with which the sailors engaged in it are frequently treated by the petty tyrants in command of the oyster-boats.

"Cremation as a Safeguard against Epidemics," by Rev. John D. Beugless, will be found in full on other pages. "The Ultimate of Sanitation by Fire," by Hon. J. M. Keating, of Memphis, was (owing to the lateness of the hour) read by abstract only, by Dr. J. B. Lindsley. We hope to present it entire hereafter.

Discussion followed by Drs. Morris, Formento, Sternberg, Beugless, Raymond, Rohe, and Bailey, pro and con, on the danger of burial and sewage, and the advantages of cremation for dead bodies and all refuse. Further abstract and other papers postponed to next number.

VENTILATION AND WARMING BY IMPROVED GRATES.

DR. A. N. BELL.

DEAR SIR: We read with great interest your article on "Ventilation and Warming" in the September number of THE SANITARIAN, and among other of its excellent points we feel desirous of indorsing and emphasizing the initial statement, "It may be accepted as a general truth, that no system of warming inhabited buildings which does not *include* arrangements for effectual ventilation should be adopted." Setting out with the proposition that the heat, necessary to the production of a comfortable warmth in dwellings, offers a motive-power sufficient for moving and changing the atmosphere therein, and rapidly enough for excellent ventilation, permit us to add that in every system of heating residences there is enough *wastage* of heat to secure a perfect ventilation of the house, if such wastage were but properly directed and utilized.

We will illustrate this proposition by a brief examination of the prominent methods of heating now in use.

Heating by stoves is a method that offers but exceedingly limited and entirely insufficient means of ventilation, as it produces but very little change of air in the rooms, automatically. If to the action of the stove there is supplemented an intelligent opening and closing of air inlets and outlets, as by the raising of a lower window-sash and the lowering of an upper sash, the heat of the stove will cause a circulation of incoming air into the lower levels of the room, and outgoing air from the higher levels, but this is at the expense of an enormous wastage of heat, besides being obviously imperfect in its action and unreliable in method.

Heating by steam radiators in rooms is but a different form of stove heating, and where these are placed beneath windows with air inlets around them, and ventilators for the escape of air are provided near the ceiling, there is a wastage of heat with no commensurate excellence of ventilation; as, at best, there is but a provision for the *dilution* of the foul air of the room instead of its removal.

Two features are essential to an efficient method of ventilation, both of which are absent in any system of heating of the character of the foregoing—viz.: first, one that will both bring air into and take it out of the rooms; and, second, one that will introduce *warm* air into the rooms.

For the latter purpose ordinary grates are ruled out. They are very efficient in their office as exhaust-shafts, as they take from the lower levels of the rooms sufficient volumes of air to thoroughly ventilate the rooms, if it were only the vitiated air that they thus remove. But the air taken from near the floor, where grates of the ordinary construction alone are used, is probably the *purest* air in the rooms, for, to supply the draught of the grates, air is drawn in *cold* through the crevices around exterior doors and windows, and from its density this air naturally falls to the floor to join in the current toward the open fire, whilst the warmer air (in which are included the breath and other exhalations from the bodies of the occupants of the rooms) remains comparatively undisturbed above the breathing-line. Moreover, the office of ordinary grates as exhaust-machines may also tend to draw air into the rooms they occupy,

from neighboring rooms, halls, and perhaps water-closets, which may tend further to vitiate the atmosphere instead of purifying it by ventilation. Hot-air furnaces, steam-heating by indirect radiation, and like methods that introduce volumes of pure warmed air into the rooms, are ruled out by the first proposition, in that they provide no automatic means for the removal of the vitiated air.

Such apparatus are excellent from one aspect, viz.: large volumes of pure, warm air are provided and are directed into the rooms. But suppose the rooms were made as nearly air-tight as art could make them, then none of the air-current from the furnace could enter the rooms. To enable the heated air to enter at all, openings for the exit of the air already in the rooms must be provided, as they already exist, perhaps, in the imperfections of the work of the builder. If the openings for the exit of air are near the ceiling, it would seem to be self-evident (as the experiments of Mr. Warren R. Briggs, made for the Connecticut State Board of Health, conclusively prove) that the *best* air, both as to purity and warmth, would steadily escape through them, for the high temperatured pure air that enters will ascend immediately to the highest parts of the room, and for the most part reach the lower levels only when by accumulation above the room is filled in a *downward* direction. Wisdom, therefore, would direct that the outlets for vitiated air should be made near the floor. In this, however, the difficulty presents itself that, if such lower openings are made directly out to the open air, the pressure of the outdoor air will more than counterbalance the pressure from within, and there will be a current of cold air into the rooms instead of warmer vitiated air outward. If the openings near the floor be connected with chimney-flues or an exhaust-shaft, some heat supplemental to that imparted by the furnace, as it is usually arranged, is necessary to induce a current through the exit-flues. If, as is done by many who can afford it, there is also a fireplace or grate *in which a good fire is maintained* in the room heated by a furnace, then the draught from the air in the lower levels of the room, counterbalanced by the constant and equal supply of a volume of pure, warm air from the furnace to the upper levels, maintain the conditions of perfect ventilation as well as perfect heating.

That system only approaches perfection that combines in one apparatus both these features. Is it utopian to demand a heating apparatus that *shall* combine both these offices? Certainly not; for in the ventilating grate, an apparatus the reputation of which is as wide as the nation, there is just such a combination of furnace and of open fireplace as is sufficient to furnish large rooms with a plenary supply of pure warmed air and an equal exhaust from the lower levels of the vitiated air, which shall constitute not only a method of thoroughly and efficiently heating rooms *without draughts*, but also of perfectly ventilating them. These grates are, indeed, combined grates and furnaces; for, by utilizing the large surfaces above, below, on each side, and behind the fire for heating purposes, there is presented the superficial area of a furnace of considerable size, over which outdoor air, in full supply, passes and becomes thoroughly warmed ere it enters the room. The air thus provided prevents those draughts which you quote Rumford as attributing to open fireplaces, and also removes that objection to them which you yourself state when you say, "Open fireplaces are only adapted to mild climates."

Very respectfully yours, etc.,

EDWIN A. JACKSON & BRO.

NEW YORK, November 5, 1884.

HORSFORD'S ACID PHOSPHATE VS. DILUTE PHOSPHORIC ACID.—Dr. T. D. Crothers, Physician and Superintendent of Asylum at Walnut Lodge, Hartford, Conn., for the Treatment of Inebriates and Opium Cases, writes:

"October 1, 1881, I began a series of comparative studies of the effects of the Acid Phosphate (of Horsford), and the Acid Phosphoric of the U. S. P., which has been continued up to April 1, 1882, a period of six months. These studies were made on nineteen selected cases of inebriates and opium cases; patients who resembled each other very closely in natural vigor, degree of degeneration and disease. The plan pursued was to begin the use of the Acid (Horsford's) about two weeks after admission, when all the active symptoms had subsided, and continue its use for six weeks, then after an interval of one week try the U. S. P. Acid for an equal length of time. In the meantime noting the pulse, weight, and general condition

of the patient, every day. Reversing the order in other cases, that is—U. S. P. Acid first, then Horsford's Acid last. The difference in every case, after excluding all possible complications, was very prominent; consisting of increased nerve-force, improved heart action, lessened nutrient perversions, and a somewhat remarkable change in the *delusions* and *insomnia* present in *many cases*. The memory and all the *mental* operations were visibly strengthened—in one case the patient could not write to his wife, or concentrate his mind on any topic, unless he used a small dose of Horsford's Acid; the other acid would not answer, and although he did not know the difference, it had not the same effect. My studies are not yet complete, because they do not cover a large enough field, or cases that are treated long enough. But I can say at this time, that I think the following facts are already indicated from this limited study:

"*First.*—Horsford's Acid Phosphate is a remedy of great value in Inebriety and Opium-taking, particularly in building up functional energy and brain force.

"*Second.*—It excels the U. S. P. Acid in every case where this may be indicated.

"*Third.*—As a nutritive medicine, so far it seems unequalled in its power of restoring the building-up forces of the body."

BACILLUS OF TUBERCULOSIS.—So many methods of observation and of staining the bacillus of tuberculosis have been suggested and recommended as possessing various advantages, that a systematic investigation of their comparative merits seemed to be necessary in order to the determination of the diagnostic value of each. Such an investigation has been very thoroughly carried out by Dr. Harold C. Ernst, of Jamaica Plains, Mass., and the results are given in the October issue of *The American Journal of the Medical Sciences*. These results have been obtained after the expenditure of much time in the preparation of the slides, much care in the selection and compounding of the staining reagents, and by the most careful comparison of the slides one with another.

As far as his experience goes, and Dr. Ernst has tried every method of staining that he has been able to find mentioned, Koch's and Ehrlich's methods are the only ones upon which

reliance can be placed under all circumstances. With neither of them has he succeeded in finding an organism besides the bacillus of tuberculosis which would resist the decolorizing action of nitric acid, and which would not take the contrast color. Therefore, as all the others seem to be untrustworthy from a diagnostic point of view, one of these two methods, more especially that of Koch, should be used in all investigations upon this subject. Unless one of them is used, every observer is liable to the error of mistaking other organisms for the bacillus of tuberculosis, or to the still greater one of failing to detect it in places where proper methods of manipulation make its presence very manifest.

As far as the observation of Dr. Ernst extends, the fact of the occurrence of a peculiar form of bacillus in tuberculous lesions is an invariable one. He has never met with a case which could be considered tuberculous in which he has failed to find bacilli in larger or smaller numbers, and examinations, yielding negative results as regards the occurrence of bacilli with the special staining reaction of the bacillus of tuberculosis, have been made in a large number of cases of sputum, from other diseases than tuberculosis.

Dr. Ernst also narrates a series of inoculation experiments, which he made with great care, with pure cultures of the bacillus tuberculosis, and in all but one case, in which no result was obtained, the characteristic bacilli were found, thus constituting confirmatory evidence of the specific nature of the bacillus of tuberculosis.

POISONOUS CANDY.—A recent number of the *Erie Dispatch* reports more than twenty cases of poisoning, which on the investigation of Dr. E. W. Germer, the health officer, were traced to a small one-cent candy sold, called the "Little Mechanic," manufactured by a Buffalo firm. The candy is stuck on the end of a small copper bronze hatchet, and upon detaching the candy from the hatchet handle the Doctor found a large deposit of acetate of copper, formed by the sugar's contact with the copper. He discovered that in all cases reported the children had eaten of this poisonous candy, and last evening he gave official notice prohibiting its further sale, and threatening to prosecute any one caught selling it. A dog

was last night made to swallow the verdigris collected from a candy and was immediately poisoned.

MORRISTOWN, N. J.—We are gratified to observe that an intelligent correspondent on sanitary subjects, who signs him-J. C. P. (whom we take to be J. C. Pumpelly, Esq.), is, through the columns of *The Morris County Chronicle*, urging the necessity of doing away with the cesspools and other filth stores of this goodly town ere the arrival of the cholera next year, which always seeks such places for its chief devastations. If the people are wise they will profit by these timely admonitions, and hasten the adoption of such measures as will effectually disarm the deadly foe at the threshold.

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH ENDING SEPTEMBER 30, 1884.

Arrival.	Vessels.	From.	Passengers.	Deaths.	Births.
Sept. 3,	Westerland,	Antwerp,	556	1	
" 4,	Hungaria,	Hamburg,	490		1
" 5,	Republic,	Liverpool,	515	1	
" 9,	Devonia,	Glasgow,	565	1	
" 9,	Rhaetia,	Hamburg,	611	1	
" 13,	India,	Hamburg,	266	1	
" 13,	Eider,	Bremen,	509	1	
" 14,	Celtic,	Liverpool,	666		1
" 15,	Arizona,	Liverpool,	654		1
" 17,	Rhein,	Bremen,	904	1	
" 18,	Rhynland,	Antwerp,	480	2	
" 19,	Hammonia,	Hamburg,	750	1	
" 19,	Hekla,	Copenhagen,	484	1	1
" 21,	Germanic,	Liverpool,	809	1	1
" 24,	St. Germain,	Havre,	284	1	1
" 26,	Lessing,	Hamburg,	512	2	
" 26,	Adriatic,	Liverpool,	619	1	2
" 27,	Elbe,	Bremen,	1031		2
" 29,	City of Rome,	Liverpool,	867	1	
			11,972	17	10

MORTALITY STATISTICS ABROAD.

THIRD QUARTER. ENDING SEPT. 30, 1884.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Typhoid and Typhus Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,019,361	20,965	7,813	1,857	369	346	419	505	298	196	3,250	20.9
Liverpool, 573,202	3,929	1,411	...	18	29	181	133	55	22	660	27.4
Glasgow, 517,941	3,349	844	443	59	121	69	176	63	..	318	25 1
Birmingham, 421,258	2,451	925	...	4	30	94	96	18	..	552	22.1
Dublin, 351,014	2,163	538	203	40	96	...	28	41	..	223	24 6
Manchester, 338,296	2,237	793	...	3	43	21	29	21	..	347	26.5
Leeds, 327,324	2,117	780	...	12	80	37	39	24	..	432	25.9
Sheffield, 300,563	1,927	692	...	5	120	2	21	22	12	429	25.6
Edinburgh, 246,703	1,043	267	116	16	8	6	59	16	..	82	16.6
Belfast, 216,622	1,101	259	162	3	27	...	13	13	..	105	20.3
Bristol, 215,457	912	276	...	7	7	1	22	14	..	100	16.9
Bradford, 209,564	1,111	346	...	1	7	84	11	11	..	194	21.2
Hull, 181,225	1,091	453	...	1	8	25	11	22	6	264	24.7
New Castle, 151,325	926	318	...	1	26	2	13	14	.	112	24.5
Havre, 105,867	980	385	56	17	2	...	2	21	2	294	37.0
Reims, 93,823	857	457	42	16	4	...	2	27	..	408	36.5
Nancy, 74,954	459	114	21	4	2	...	1	26	..	82	24.5
Breslau, 290,000	2,722	1,255	163	43	12	44	3	30	..	646	37.3
Brussels, 171,293	1,040	326	110	24	7	2	7	11	14	289	24.3
Cologne, 150,513	1,239	673	84	7	2	1	19	5	1	354	32.8
Christiana, 122,000	660	215	55	38	31	...	34	1	..	137	21.6
Frankfort, 145,100	.....	....	...	..	..	...	...	..	..	...	....
Hanover, 131,200	798	365	27	4	1	6	5	13	..	195	24.3
Bremen, 119,561	664	256	42	6	53	...	2	1	..	92	22.2
Dantzic, 116,162	835	369	25	20	38	2	9	12	..	171	28.6
Stuttgart, 109,937	653	326	27	29	1	5	4	18	..	145	23.7
Strassburg, 110,739	752	404	43	12	..	9	10	6	..	264	27.8
Dusseldorf, 105,287	798	499	25	10	7	4	12	9	..	261	29.8
Nuremburg, 105,176	773	382	53	14	2	16	11	7	..	245	29.4
Chemnitz, 102,718	997	634	18	34	7	...	5	7	..	32	38 8
Magdeburg, 105,000	858	432	41	24	15	2	14	12	..	214	32.7
Elberfeld, 101,000	661	257	41	16	18	22	1	8	..	105	25.8
Barmen, 100,000	.....	....	...	..	..	...	...	..	..	...	....
Altona, 97,000	698	314	59	14	18	2	6	9	..	182	28.8
Aix-la-Chapelle, 89,116	.....	....	...	..	..	...	...	..	..	...	....
Mayence, 64,120	406	153	22	5	6	...	1	12	..	79	25.3
Amsterdam, 350,202	2,494	....	...	103	128	49	33	20	..	71	27.6
Rotterdam, 166,001	949	....	...	17	24	29	3	3	..	23	22.9
The Hague, 131,417	959	....	...	14	4	26	...	3	..	44	29.2
Lyons, 376,613	2,374	....	215	17	4	25	44	70	17	2,302	25.0
Berlin, 1,225,065	10,516	5,756	431	454	64	45	174	98	4	3,814	34.3
Hamburg, 486,678	3,191	1,246	218	104	22	15	28	25	..	568	20.6
Dresden, 236,000	1,751	814	98	56	11	14	44	11	1	271	29.6
Munich, 240,000	1,951	941	147	20	14	11	34	18	..	514	32.5
Leipzig, 164,636	1,165	655	59	45	17	16	16	7	1	314	28.3
Kœnigsburg, 154,000	1,220	628	54	47	36	...	...	16	1	328	31.7
Bucharest, 200,000	1,253	413	118	33	51	27	5	26	1	239	25.1
Paris, 2,239,928	13,508	3,097	785	334	42	305	128	486	12	2,302	24.1

MORTALITY STATISTICS IN THE UNITED STATES.

FOUR WEEKS, ENDING SEPTEMBER 27, 1884. Correspondents under this head will please send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
†Burlington, Vt., 12,500	...	...	...	..	..	..	..	..	..	...	....
Boston, Mass., 427,940	873	424	178	34	12	..	26	31	..	180	26.4
Lowell, Mass., 68,500	...	...	..	..	..	..	..	..	..	...	....
Lynn, Mass., 38,284	...	...	..	..	..	..	..	..	..	...	....
Somerville, Mass., 28,663	...	...	..	..	..	..	..	..	..	...	....
Worcester, Mass., 58,295	128	61	19	8	..	..	1	..	..	43	28.5
†Providence, R. I., 120,000	197	92	28	3	5	..	4	8	..	43	19.7
†New Haven, Ct., 75,000	103	21	21	4	..	..	1	6	..	26	16.5
New York, N. Y., 1,356,958	2,839	1,372	594	91	26	33	66	91	..	552	27.0
*Brooklyn, N. Y., 624,118	916	476	182	32	1	2	25	37	..	234	24.7
Rochester, N. Y., 105,000	...	...	..	..	..	..	..	..	..	...	....
Albany, N. Y., 97,344	127	37	38	1	1	..	..	9	..	22	16.9
†Auburn, N. Y., 25,000	32	16	7	..	..	..	..	..	..	6	15.3
Yonkers, N. Y., 21,000	32	11	7	..	1	..	..	1	..	4	18.9
West Troy, N. Y., 13,000	23	10	3	1	1	..	..	2	..	4	23.0
Hudson Co., N. J., 209,000	339	153	55	4	9	1	..	6	..	43	21.1
†Paterson, N. J., 57,000	124	67	10	..	1	..	1	16	..	22	26.1
§Philadelphia, Pa., 927,995	716	277	131	48	6	..	8	26	2	48	20.4
§Pittsburg, Pa., 180,000	168	99	23	10	3	4	1	12	..	55	24.7
†Erie, Pa., 36,768	49	26	7	2	..	..	..	4	..	14	15.9
Wilmington, Del., 51,500	93	42	13	7	2	..	1	7	..	13	22.7
Cincinnati, O., 280,000	420	180	58	12	4	..	1	20	..	49	14.5
Cleveland, O., 200,429	370	236	45	12	..	3	5	21	..	125	24.0
†Toledo, O., 52,000	90	44	18	2	2	..	2	3	..	13	20.8
†Detroit, Mich., 140,000	297	102	26	20	..	1	2	15	..	73	25.8
Evansville, Ind., 40,000	69	28	6	..	..	..	..	5	..	19	22.4
Rock Island, Ill., 11,650	11	4	3	..	..	..	..	..	..	‖1	12.2
†Chicago, Ill., 630,000	1,012	575	123	53	16	12	13	47	..	212	19.2
†St. Louis, Mo., 400,000	673	306	96	35	11	..	2	72	..	89	20.1
†Milwaukee, Wis., 150,000	278	107	30	4	4	..	3	11	..	75	22.2
Salt Lake City, Utah, 25,000	35	11	5	1	..	..	..	2	..	10	20.6
†San Francisco, Cal., 235,000	364	79	68	15	1	..	..	18	..	12	18.5
†Minneapolis, Minn., 100,000	174	90	17	20	..	..	2	28	..	23	20.8
†St. Paul, Minn., 100,000	134	85	13	10	..	2	..	12	..	29	16.0
Baltimore, Md., 408,520	656	286	104	46	3	..	9	38	..	62	20.8
†Dist. of Columbia, 200,000	426	197	70	10	12	1	9	49	..	66	25.5
†Richmond, Va., 73,400	169	73	20	1	..	1	..	18	..	22	27.6
Lynchburg, Va., 23,000	29	14	1	2	..	..	..	4	..	7	15.7
New Orleans, La., 234,000	477	129	71	14	2	..	2	71	3	33	26.6
†Nashville, Tenn., 50,000	91	33	11	13	..	..	1	18	..	15	21.8
†Mobile, Ala., 31,295	75	21	15	1	..	..	..	13	..	2	28.6
Grand Rapids, Mich., 42,000	...	...	..	..	..	..	..	..	..	...	....
†Lansing, Mich., 9,784	13	5	3	..	..	..	..	1	..	2	16.1
§Newark, N. J., 147,000	171	76	26	18	2	..	..	4	..	4	30.2

* 3 weeks; † Month of September; § 2 weeks.

OBITUARY.

CHARLES WALTER CHAMBERLAIN, A.M., M.D.

FOR the following tribute to this distinguished sanitarian we are indebted to our esteemed contemporary, *The New England Medical Monthly*:

"Dr. C. W. CHAMBERLAIN, whose sudden death occurred on August 21st, had for a number of years filled a very important place in the history of the State and in Hartford, as far as it relates to study of and care for the public health. He was deeply read in his profession, especially in that part of it which treats public health on a large scale, rather than the separate ailments of individuals. In private practice he was sound in judgment, skilful, and one who was frequently called in consultation in important cases. With the large amount of official duty that came to him for some years past, he had neither time nor inclination to attempt a large general practice, and far the larger part of his work was in the directions first mentioned. He was one of the most active promoters of the organization of the State Board of Health, of which he has been Secretary since its organization. With him in this work for organization was Dr. Lindsley of New Haven, who was probably the most active worker for the establishment of the Board, and who is already mentioned as the natural successor of Dr. Chamberlain as Secretary. The work of the State Board did not prevent his spending a great deal of time on hygienic matters more directly connected with Hartford. He has been specially active in the recent work of the health committee and in the attempt to establish a local board of health in place of the present committee. He was active in pressing sanitary measures before the legislative committee. Some of them were enacted into laws, and a good many more were defeated in the ordinary course of nature. At the last session he worked hard to secure the passage of a law requiring proprietors of so-called patent medicines to print on the label the constituents and their proportions, as a safeguard to the public, and a thing

that could cause no damage if the preparations were suitable for use. In various meetings of the State, County and City Medical Societies his opinion always carried weight, and he was recognized as an authority, and in some matters as the leading authority in the State. He was a member of the American Medical Association, and during the recent meeting of that society and the National Health Association at Washington, presided over a section of the latter body. His death is a loss to the city and to the State.

"The cause of death is obscure. It was a case of rather rapidly developed tetanus, which was not recognized until some days after the earlier symptoms had been noticed, and which is not directly explained. It has been stated that he was in his usual health on Monday, 18th. This is hardly correct. He had for some days felt slight rigidities in the region of the throat, which he thought might indicate a spinal trouble, especially as he had had some indications of such affection about a year ago. Monday evening he was present at the Council meeting, but went home and was attacked with more violent symptoms of the same kind. He grew worse from this time, and on Tuesday morning sent for Dr. Howe. Subsequently Dr. Fuller, Dr. Frœlich, Dr. Barrows, and Dr. Root were in attendance, Dr. Jarvis, with whom he was associated, being absent from the city. The rigidity of the muscles increased and extended downward. Dr. Chamberlain himself considered the attack fatal, and while he was able to walk about, as he was until late Wednesday, attended to the disposition of many matters. By noon Tuesday the jaw was fixed, and after that time he could take only liquid nourishment. He retained his consciousness until about an hour before his death, and was self-possessed and calm in the face of what he considered inevitable.

"Dr. Chamberlain was a graduate of Brown University and of the College of Physicians and Surgeons in New York. He went to Hartford in 1871, and after a time was associated with Dr. Campbell. For six years he had been associated with Dr. Jarvis. He was forty years of age, and was born at Providence, R. I., the son of a Congregational minister who died a few years ago in East Granby. There were four children, two sons and two daughters. A brother of Dr. Chamberlain

lives on Staten Island, a sister--Mrs. H. H. Burnham—in Putnam, and another sister, Miss Minnie B. Chamberlain, is a teacher at the South School, in Hartford.

"The following, prepared by a physician, a personal friend of Dr. Chamberlain, will be read with interest:

"'The sudden death of Dr. Chamberlain, in the fulness of his manhood, has removed from our midst a figure characteristic in its way and well known to many of our citizens. It has removed from the intellectual forces of the city a mind of extraordinary capacity, whose analytical powers were as remarkable as its attainments were comprehensive. The doctor was a scientific physician and a progressive sanitarian, fully abreast of every new fact, every new theory, every effort to advance, and not infrequently deducing novel and effective means of procedure from what, as yet, had hardly become the property of the profession. His standing among the physicians of the State was of the highest, and "Chamberlain's opinion" carried a weight which his years and limited practice would at first hardly seem to warrant. But it was generally so sound, so logically deduced from a sharp analytical view of the case as to induce reliance on it. As a practitioner, Dr. Chamberlain was kind, assiduous, and very successful when once engaged in a case, but he was languid and unready in assuming new business. In consultation he was helpful, with abundant light and a readiness to show all that related to the subject, while very honorable in acknowledging the efforts of the attendant physician. As a sanitarian he made in a very few years and with but half-sufficient means the Connecticut Board of Health, of which he was the Secretary and leading spirit, a model institution, and from his reports were copied and quoted, the world over, those life-saving thoughts which he had evolved or deduced, and the facts he had obtained through an observation at once acute and comprehensive. As a man, Dr. Chamberlain was of refined tastes. He was an enthusiastic lover of music, admired the bright products of light literature, and was a steady patron of the theatre. Among his special enjoyments were a clever joke, a good game of whist, and a fine picture; to the consideration of each he would bring a depth and a brightness that gave

new value. His manners were easy and genial, his views very broad and philosophical.

" ' He took a great interest in the city medical societies, and was for many years the Secretary of the Hartford County Medical Society and of the Connecticut State Medical Society. In the latter capacity he introduced many needed reforms and brought order into the management of the organization. His retirement from the position was voluntary, but owing much to his liberal views on medical ethics. In these he sympathized entirely with the New York body of physicians who declared consultation with fairly qualified irregulars not improper. In 1878, when the motion for a Board of Health was before the Connecticut Legislature, after having been lost on two previous occasions, the doctor rallied all his friends and mustered all his forces to the support of the measure, and, with much effort, successfully carried it. It has been a blessing to the State since, and stands foremost among institutions of this kind. He was elected its Secretary, and held that position at the time of his death. His six annual reports are his monument, and an ample one in the eyes of all to whom sanitation and social science are questions of importance.'

" The doctor was unmarried. He leaves behind him, aside from his immediate family, the strong love of a few friends and the respect of the State and his profession.

" The funeral of Dr. Chamberlain was held at his residence on Asylum Street, Friday morning, and was attended by the medical society of Hartford, some forty of whom were present, and by many physicians from out of town, including Professor Brewer and Professor Lindsley of Yale. There were also many residents of that city. The service, which was held at 9.30, was conducted by the Rev. Dr. Davis, who read from the Scriptures and made a short address, in which he eulogized the life and services of Dr. Chamberlain. Prayer was offered by the Rev. William H. Moore. Opportunity was given for those present to take a last look at the deceased. At 10.20 o'clock the remains were taken to the depot, and by train to Bristol for interment. The pall-bearers were Drs. Campbell, Mayer, Howe, E. K. Root, Cressy, and Fuller. In addition to these, a delegation of the society went to the interment ceremonies at Bristol."

FREDERICK WINSLOW HATCH, A.M., M.D.

DR. F. W. HATCH, Secretary of the State Board of Health of California, and widely known as an accomplished Sanitarian, died at his place of residence, Sacramento, Cal., October 16, 1884, aged sixty-three years and eight months.

Dr. Hatch was born in the State of Virginia, March 2, 1821. He went to California at an early period, and became a resident of Sacramento from a very early date in her eventful history. He was a thorough physician, and entirely devoted to his profession. He was a devoted student and the author of many papers upon important topics relating to medical progress, and especially upon sanitary science and public hygiene. He was Secretary of the State Board of Health from the time when Dr. T. M. Logan died, February 13, 1876, and was Secretary of the City Board of Health of Sacramento, with but a brief interval, from the time of its institution several years ago. As such, he was greatly interested in the statistics of public health, sanitation and meteorology, and was one of the best informed men in the country upon those topics. Dr. Hatch moved but little in public, being of a retiring nature. He was, however, a man of profound convictions, and took strong grounds, as his researches and reason justified. He was recognized as a valued citizen, and profoundly attached to his home city, and one whose death is a loss to the whole community. He was a man of strong domestic tastes and warm affections, though not demonstrative. He attended the American Medical Association as a delegate in Washington, at its latest meeting, in May last. On his return, while at New Orleans, he took a severe cold, which was aggravated before he reached home, and resulted in a congested state of the lungs of tenacious character. He arrived at his home quite ill, and except on one occasion, when he visited his office, he was from that time closely confined to his house. Some years ago he had a severe attack of pneumonia, and never regained his full vigor. The immediate cause of his death was suppression of the functions of the kidneys. Dr. Hatch leaves a widow, and among other members of his family, a daughter in the northern part of the State, wife of Judge George A. Blanchard, and a son, Dr. F. W. Hatch, Jr., who is Assistant Resident Physician at the Napa Insane Asylum.

LITERARY NOTICES.

REPORT OF SURGEON-GENERAL OF THE NAVY.

THE *Sanitary and Statistical Report of the Surgeon-General of the Navy for the Year* 1882 has just been received, and continues the work of its immediate predecessors in supplying a mass of the exact statistics of disease, which we may some day hope to have accomplished in civil life. It is a matter of regret that these reports, do not appear until so long after their actual dates. Had the present volume been published simultaneously with its letter of transmissal in 1883 the comparison would not have been possible, which is now inevitable, between the developments of fraud a few months later and the following statement on page 6:

". . . The task [elevating the professional standard of the Medical Department, etc.] has been accomplished *only by unwearied attention to minute administrative details in expenditures;* and though the department has been tided over the embarrassments arising from insufficient appropriations, yet the effects of this policy have been felt."

The appropriation for the Medical Department of the Navy, $139,860, for the year ending June 30, 1884, as that of previous years, was shamefully small, but the melancholy fact remains that even of this pittance $25,000 have been yearly stolen by the dishonest clerks and employés, whose peculations were exposed early in this year, very soon after the Bureau had taken to itself so much credit for "unwearied attention to minute administrative details in expenditure," but which had not been suspected when the above paragraph had been written.

We must take exception to one other statement in this report. On page 5 we read:

"Prior to the issuance of the above-mentioned report [that issued in 1880] outside of individual impressions and experiences published from time to time in a fragmentary form, there existed *an absolute ignorance* of all matters pertaining to these topics so essential to a correct appreciation of and progress in nautical sanitation."

It is not just to the medical corps of the Navy to stamp it in this broad way as *absolutely ignorant*, up to four years ago, of *all matters essential to a correct appreciation of and progress in nautical sanitation.* The battle of naval hygiene had been fought by zealous and intelligent workers even in our own time, of whom RUSCHENBERGER was a pre-eminent example, and we are conscious that we ourselves, when we wore the uniform of a medical officer of the Navy, were not so "absolutely ignorant" as here stated of its principles and necessities. Certainly WILSON'S work on "Naval Hygiene" appeared three times four years ago, and an edition of GIHON'S "Naval Hygiene," dated 1872, is now on our desk. It can hardly be assumed that these men and TURNER, who was Secretary of the National Board of Health certainly before 1880, were absolutely ignorant of what they made their daily study and life-work, and DR. WALES himself will doubtless not care to assume that his own enlightenment did not antedate the birth of his first report in 1880, which by the way was the work of these other absolutely ignorant men in 1878. Rash statements like these have come from hasty and doubtless thoughtless writing.

The plan of the volume is the same as that of its predecessors. We note, however, a regrettable falling off in the number and character of the special sanitary reports which used to be a notable feature of the Surgeon-General's report. There are none of the extended essays which once constituted so valuable a portion of it, and the "Medical Topography and Sanitary Reports" have dwindled down to four from the North Atlantic Station [thirty-seven vessels] by DRS. WALTON, BRUSH, MARMION, and SIEGFRIED; one from the South Atlantic Station [three vessels] by DR. BURBANK; and three from the Pacific Station [thirteen vessels] by DRS. WHITE, RUTH, and HALL. The four vessels of the European Station furnish none at all, and the seven of the Asiatic Station only one by DR. WOODS.

The space (the volume with its index numbers 622 pages) seems to have been given up to a tedious and superfluous iteration in the text of the figures and ratios sufficiently displayed in the tables, where they would naturally be sought by those interested in them. To detail them a second time gives the volume the uninviting character of dictionary reading.

We especially commend the computation of ratios *per thousand*, instead of per centum, and the use of the character $\frac{0}{00}$ to indicate them. We hope these invaluable statistics, which have been so successfully inaugurated in the Navy, will be continued without abatement until they are imitated wherever vital statistics are accumulated.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON GENERAL'S OFFICE, UNITED STATES ARMY. AUTHORS AND SUBJECTS. Vol. v., 4to, pp. 1,055. Washington: Government print.

This volume comprehends all titles from FLACCUS to HEARTH: "15,555 author-titles, representing 5,755 volumes and 12,596 pamphlets. It also includes 8,069 subject-titles of separate books and pamphlets, and 34,127 titles of articles in periodicals." It is in thorough keeping with the preceding volumes for fulness and excellence, illustrating the eminent fitness of the distinguished editor, Surgeon J. S. Billings, United States Army, for this, his chosen field of labor, and encourages the hope that every facility may be afforded by the Government for the early completion of this monumental work.

AMERICAN METEOROLOGICAL JOURNAL, A Monthly Review of Meteorology and Allied Branches of Study, of which we have received six numbers, May to July, is a well gotten up monthly of forty pages, devoted to a field of study which ought to place it in the hands of all students of the relations of climate to health. Every one of the numbers before us contains matter of importance in this direction, and we welcome it as a valuable helpmeet in the field of sanitary science. It is edited by M. W. Harrington, Director of the Astronomical Observatory, Ann Arbor, Mich., and published by W. H. Burr & Co., Detroit, Mich., to whom subscriptions may be sent: $3 per annum.

REASONS FOR BELIEVING IN THE CONTAGIOUSNESS OF PHTHISIS, by W. H. Webb, M.D., Philadelphia, a reprint from the *Medical Bulletin*, is a concise summary of the literature on the subject of which it treats, so presented as to be well worthy the consideration of all persons who have the care of phthisical cases.

THE UNIVERSITY OF MINNESOTA COLLEGE OF MEDICINE ANNOUNCEMENT, May, 1884, appends report of State Medical Examining Board and of all physicians in the State with certificate diplomas, together with lists of certificated licentiates who intend to practise, and of those who having practised in the State over five years before the medical regulation act went into effect, are exempt from its operation.

SEVENTEENTH ANNUAL REPORT OF TRANSACTIONS OF THE MEDICAL SOCIETY OF WEST VIRGINIA, May 21–22, 1884, S. L. Jepson, M.D., Secretary, Wheeling, W. Va. Pamphlet, pp. 70. Two papers in this report are particularly interesting to the sanitarian, the one by Dr. R. W. Hall, of Moundsville, on *Climatology and Epidemics*, and the other on *Listerism in Obstetrics—Shall we Adopt it in General Practice?* by Dr. W. H. Sharp, of Volcano. The State is compared with Switzerland, and an effort is made to show the same relation between the irregularities of surface and prevailing diseases, especially those which are influenced by temperature and moisture, on hills and in valleys. Dr. Sharp summarizes the numerous papers and discussions with which medical periodicals have been flooded within the last twelve months, on the various methods of applying antiseptic treatment in obstetrical practice, showing much good but some evil as the results of extreme practice in this regard, with which all practitioners should make themselves familiar.

HYPERÆSTHESIA, by James T. Searcy, M.D., of Tuscaloosa, Ala., is a pamphlet reprint from the Transactions of the Medical Association of Alabama, of much practical importance, as showing the chief cause of excessive nervousness, which is but another name for hyperæsthesia, to be "over-brain-work, worry . . . drugs," and that persistence in these causes frequently lays the foundation for organic disease of the brain.

OXYGEN AS A REMEDIAL AGENT, by Samuel S. Wallian, A.M., M.D., of Bloomingdale, N. Y. Pamphlet of fifty-two pages, reprint from *Medical Record*, with prefatory note and appendix. A concise and interesting sketch of the efforts which have been made from time to time, ever since the discovery of oxygen, to utilize it in medical practice; and a description of recent methods of administering it, with illustrative cases showing its benefits.

THE IMPORTANCE AND USEFULNESS OF SCIENTIFIC MEDICAL ORGANIZATIONS TO THE MEDICAL PROFESSION AND THE PUBLIC. Annual Address delivered by Henry H. Smith, A.M., M.D.U.P., President, before the Medical Society of the State of Pennsylvania, May, 1884. This is a forcible arraignment of physicians who lay themselves open to the charge of irregular practice by divesting themselves of a written *code* defining the boundary between scientific medicine and quackery; and urges the Code of Ethics of the American Medical Association as the barrier which will, if maintained in the future as in the past, drive back all attempts to overthrow the "correctness of the system of medicine that has stood the crucial test of centuries." In State medicine, however, Dr. Smith recognizes the importance of avoiding all such issues as are in conflict with the decision of the Judicial Council of the American Medical Association: "In questions of legislation and governmental policy, on which every physician as well as citizen must be allowed full liberty of opinion and expression, a conference with homœopathic or irregular practitioners is not a consultation at the bedside as contemplated in the Code of Ethics."

MADNESS AND CRIME. A reprint from the *Medico-Legal Journal* of a paper read before the Medico-Legal Society of New York, September 24, 1884, by Clark Bell, Esq., is a lucid statement of the responsibility of certain insane persons before the law—that though insane, if they know the nature and quality of criminal acts which they commit, they must be found guilty. Several cases are cited, and among the rest that of Guiteau (as probable), in support of English practice, where persons known to be insane, who have committed murder, have been found guilty and executed. Our laws on the subject are also freely quoted, with a view to showing their defects, and the importance of proposed changes.

THE CARE OF EPILEPTICS. In a paper in the *New England Medical Monthly*, of which this is a reprint, Dr. L. W. Baker, of Baldwinsville, Mass., urges the importance of constant kindly supervision by trained superintendence and teachers, in a well-appointed institution, as the only hopeful means of benefiting this class of unfortunates.

JEWISH HYGIENE AND DIET, THE TALMUD AND VARIOUS OTHER JEWISH WRITINGS HERETOFORE UNTRANSLATED. Reprint of a paper by Carl H. von Klein, A.M., M.D., of Dayton, O., read before State Medicine Section of American Medical Association, Washington, D. C. Reprint from Journal of the Association. This is a peculiarly interesting paper, in that it gives the data and meaning of many terms and expressions bearing upon sanitary science, not generally known outside the scholarship of the Jews.

PHYSICIAN'S VISITING LIST. The long-used and excellent physician's diary, published by Messrs. P. Blakiston, Son & Co., of Philadelphia, now in its thirty-fourth year, needs no new commendation from us—it has long been an indispensable pocket book to the busy practitioner, and right worthily holds its place among the first and best of its kind.

DR. SEVIER: A Novel. By George W. Cable. Boston: James R. Osgood & Co. Charity in all her beauty is seldom so truthfully described as in this story, in which are blended thoughts and suggestions anent the present crusade of sanitary science against the many stumbling-blocks in the way of mankind's elevation to a condition of natural healthfulness, and a delightful love story, of the misfortunes and fortunes of a young and struggling husband and wife.

PUBLICATIONS RECEIVED.

REPORT OF DIRECTOR OF THE AMERICAN SCHOOL OF CLASSICAL STUDIES AT ATHENS, 1882–83. Bureau of Education, Washington, D. C.

HYPERÆSTHESIA. By James T. Searcy, M.D., Tuscaloosa, Ala.

IONIA SANITARY CONVENTION PROCEEDINGS, December, 1883. Michigan State Board of Health.

LAWS OF MICHIGAN RELATING TO PUBLIC HEALTH.

AMERICAN METEOROLOGICAL JOURNAL, Monthly, May to August. W. H. Burr & Co., Detroit, Mich.

REMOVAL OF PIECE OF IRON FROM THE EYE BY MEANS OF MAGNETIC NEEDLE. Reprint. J. J. Chisholm, M.D., Baltimore.

THE SANITARIAN.

DECEMBER, 1884.

NUMBER 181.

THE MANAGEMENT OF EPIDEMICS.*

WITH a view to eliciting as much information as possible on the subject with which this committee was charged, the chairman initiated the work by a timely request of each member of the committee, for a special contribution comprehending his own practical knowledge of any subject related to it. The contributions received were as follows:

1. CONCERNING THE MANAGEMENT OF EPIDEMICS SUCH AS OCCUR IN ORDINARY INLAND CITIES IN A NORTHERN LATITUDE. By WILLIAM K. NEWTON, M.D., Health Inspector, Paterson, N. J.

. . . An epidemic of small-pox which prevailed in Paterson, N. J., in 1882–83, seems to illustrate a few important facts. First, that an aldermanic health committee, composed of laymen ignorant of sanitary matters, is not the proper body to legislate upon, or to manage public health affairs. Second, that with an intelligent public health administration there is no necessity for small-pox to gain a foothold in any city. And third, with so sure and satisfactory a preventive as vaccination

* Abstract of the Report of Committee on the Management of Epidemics read before American Public Health Association, St. Louis, Mo., October 16, 1884.

there is absolute certainty of checking the spread of this disease.

Previous to November, 1882 (the date of the formation of the local board of health), there had been 139 cases of small-pox in the city, extending over the time from June 10, 1882, to that date. Under the administration of the Health Committee of the Board of Aldermen, the disease was continually spreading, and the public became more and more alarmed at the sanitary condition of the city; hence repeated demands were made in the papers and by the public for that Board to create an independent board of health under our State laws, and to turn over to it the management of sanitary affairs. After great pressure this was done on November 16, 1882; and it was remarkable to observe the effect this action had upon the public mind, and what threatened to become a panic passed away, and the people seemed to rest assured that the proper authority had assumed control.

Besides the great unrest that prevailed, the people were aware that the city was losing a large amount of money by the mismanagement of the epidemic; this loss was not only a burden to trade and manufactures, but the city itself had spent about $20,000 in the various endeavors to check the spread of the disease.

As an illustration of how one important branch of the service was managed, the manner of buying and using vaccine may be noticed. This important article was purchased from a person not skilled in the selection of the virus, hence the vaccinations were in a large number of cases total failures.

When the Board of Health took charge the following plan was pursued:

A notice of the existence of a case of small-pox being received the Health Officer immediately visited the house. If the case could be safely isolated in the house, arrangements were made for strict quarantine, and the family was made to understand that it was only by favor that the patient was allowed to remain in the house, and not taken to the city hospital. The family was also informed that any breaking of quarantine would be followed by quick punishment. Quarantine at home was only permitted when but one family occupied the house. Every person in the house except the sick was

immediately vaccinated. As a rule, two insertions were made, and the people in the neighborhood were offered free vaccination. A placard was placed on the house warning all persons not to enter or leave, except the physician in attendance and the Health Officer.

Upon recovery of the patient he was given a thorough bath, and new clothes were put on. The bedding was removed to the hospital grounds in the ambulance and burned; sheets, blankets, and underclothing were soaked in a solution of sulphate of zinc; the room and all clothing left in the house were then fumigated by burning sulphur for twenty-four hours. If it was impossible to isolate a patient in the house, he was immediately sent, with all his clothing and bedding, in the ambulance to the city hospital. All in the house and all persons in the neighborhood were vaccinated, and strict watch was kept over the house from which the patient was taken until the period of incubation was passed. In case of death, the corpse was wrapped in a sheet saturated with a solution of sulphate of zinc and buried as soon as possible.

The method thus outlined worked admirably and no extension of the disease took place. Success may be ascribed to the attention paid to details, and to the care with which vaccination was done.

One fact struck me forcibly while engaged during the epidemic: that was the number of cases which occurred in the filthy quarters of the city. It was remarkable that, with but few exceptions, the victims of the disease belonged to the lawless class of the community: drunkards, abandoned women, the careless and the shiftless.

. . . Prior to the formation of the Board of Health there had been 139 cases in the city; and when the Board commenced work there were 19 foci of infection to contend against. In November, 1882, 13 cases were noted; in December, 31 cases; January, 1883, 3 cases, during which month the disease was eradicated.

Attempts have been made also to control the spread of scarlet fever and diphtheria, by the adoption of stringent rules requiring first cases to be promptly reported by the attending physician, strict exclusion, and, in cases of school-children, prompt notice to the school authorities prohibiting attendance.

Competent persons are employed by the Board to take charge of disinfection, to visit infected houses and instruct the family in the methods of disinfection, and at the termination of the case to personally disinfect the premises. Exposure of a corpse, or a public funeral is forbidden under a penalty of $50.

. . . In consideration of the trouble taken by the physician, the Board allows a fee of twenty-five cents for each case reported. This fee is, of course, merely a recognition of the fact that a physician is entitled to compensation for service rendered, and is the first time, I think, that this has been allowed in the United States. While we have had no case of refusal to report, the fee is rarely claimed, and the Board has been compelled in many instances to make out the amounts due the reporters and to ask them to call and collect the same. We have heard nothing of the "rights" of physicians or patients being invaded by the action of the Board, or by the visits of the inspector; this exaggerated feeling being confined apparently to the English journals.

2. THE MANAGEMENT OF EPIDEMICS IN THE CITY OF CHARLESTON, S. C., WITH ILLUSTRATIVE CASES. By H. B. HORLBECK, M.D., City Registrar and Secretary of the Board of Health.

The detail of the measures pursued in Charleston, as described by Dr. Horlbeck, is very similar to the preceding account by Dr. Newton, for Paterson, and with the same satisfactory results. Every case of diphtheria, scarlet fever, measles, cholera, small-pox, and typhoid fever is necessitated to be reported at the Registrar's office, and promptly dealt with by the health authorities. "The education of the people by constant supplies of clearly written and condensely expressed circulars, never more than one page, containing formula of disinfectants with method of application, is the strongest vehicle which we possess. . . . The lesson taught is that the disease (small-pox) can be kept in abeyance and eradicated."

3. QUARANTINE AND SANITATION. By JOSEPH HOLT, M.D., President of Louisiana State Board of Health.

Dr. Holt's report consisted of a description of measures recently adopted, and of other means in process of construction,

for the expeditious and thorough disinfection and cleansing of vessels and merchandise at the Mississippi Quarantine :

By washing all accessible places on board ship with a solution of bichloride of mercury ; and for all places and recesses not thus accessible, by means of sulphurous acid propelled by an apparatus now in process of construction, to such an extent and for such a length of time as to be sure of destroying all foul emanations and germs of whatever kind. The purpose is to so apply these means, in conjunction with cleansing, as to wholly do away with the system of detention of infected vessels and merchandise, which has hitherto obtained at that station, by a system of active and thorough sanitation and prompt *pratique* instead of detention ; insomuch that vessels and merchandise will be detained only so long as may be necessary for cleansing, and persons only till the period of incubation is passed.

It is my privilege to add the following in connection with my own recent practice, as reported by my colleagues :

MANAGEMENT OF MEASLES, WHOOPING-COUGH AND DIPHTHERIA. By GEORGE B. FOWLER, M.D., Visiting Physician, New York Infant Asylum.

NEW YORK, October 11, 1884.

A. N. BELL, M.D., Chairman of Committee, etc.

DEAR DOCTOR : I cheerfully comply with your request for my view of the value of the hygienic measures instituted by you at the country home of the New York Infant Asylum, for the suppression of a most severe epidemic of whooping-cough, measles, and diphtheria, during the summer and autumn of 1883.

The home is situated in the town of Eastchester, Westchester County, N. Y., upon an elevated and attractive plot. It consists of a large main building and five outlying cottages, besides an old residence. With the exception of this last, each house was constructed under careful supervision to meet the wants and emergencies natural to an institution devoted to the care of women and children.

Early in July, when the number of inmates was about 320 (223 children and 97 women), whooping-cough began to prevail, and soon after a case of measles appeared in a ward of

the main building. Without going into details (which I have done in another place), suffice it to say that, despite the efforts of resident officers and visiting physicians, the disease spread from child to child, and very soon an epidemic was prevalent. In harmony with the generally recognized fact, that the acute infectious diseases of children are very closely associated and liable to follow each other, we, in a very short time, discovered several cases of diphtheria.

When it is remembered that, as a general rule, those children attacked by one disease were either suffering from another, or just convalescing, and taking into consideration the peculiar malignant type of measles which prevailed, and the universal prevalence of several pulmonary, brain, and bowel complications, some conception may be formed of the conditions with which we had to cope.

On account of the triple character of the epidemic and the fact that in frequent instances a child would be suffering from two or even *three* diseases, the difficulties in the way of successful isolation were very great; for there were twelve classes of children to be kept separate:

1, measles; 2, measles with whooping-cough; 3, whooping-cough; 4, convalescent measles; 5, doubtful whooping-cough; 6, doubtful measles; 7, those who had been exposed to measles; 8, those exposed to whooping-cough; 9, diphtheria; 10, doubtful diphtheria; 11, whooping-cough with diphtheria; and 12, healthy children.

However accurately the division might have been made at any one time, it is evident that the prevalence of either of the prevailing affections in an isolated colony hitherto free from it would instantly upset the entire arrangement and necessitate another decision. And thus it frequently happened to us. To have successfully carried out quarantine and isolation, a more expensive provision and a greater number of assistants than were at our command, or that of any other institution, would have been necessary. Under your orders and immediate supervision, very energetic measures were instituted looking toward thorough disinfection and as complete isolation as possible under the circumstances.

I have no doubt but that had your specific directions been followed from the first, the epidemic would have been of shorter

duration and milder type. But on account of an unfortunate misunderstanding and conflict of authority, the separate wards were subjected to the fumes of a small quantity of sulphur which proved ineffective. When your orders were strictly carried out—the entire house or cottage being vacated by the inmates, the bedding, clothing, and utensils only remaining, the fireplaces, windows, and outside doors closed and sealed, and the communicating doors left open, and several hundreds of pounds of sulphur burned, disinfection was accomplished.* This process was repeated successively several times, from house to house, with a continued round of vacating and reoccupancy, and the diseases immediately ceased to prevail, and have not since appeared. During the height of the epidemic we had, at your suggestion, recourse to tents in which to place our diphtheria cases and their isolated nurses.

In my opinion, properly constructed tents, such as were used on this occasion, offer the best possible means of treating infectious diseases, in that the ventilation is perfect and constant, and, under proper care, draughts are impossible. The manifest improvement in our cases thus housed or tented maintained this well-established fact.

And, in conclusion, let me add that I am convinced that the practice which you have instituted at the institution, of a systematic and thorough fumigation with sulphur, of every cottage once every four weeks, as a measure of purification and protection, has mainly contributed to the health of the inmates during the past year.

MANAGEMENT OF PUERPERAL FEVER. By J. CLARK THOMAS, M.D., Visiting Physician Lying-in Department, New York Infant Asylum.

NEW YORK, October 9, 1884.

DEAR DR. BELL: Your letter requesting of me an account of the management of the epidemic of puerperal fever in the city branch of the New York Infant Asylum, last January and February, was duly received. If the reply is too extensive, my plea is: the subject cannot be treated at the same time briefly and justly.

* The amount of sulphur used was three pounds to every thousand cubic feet of space to be disinfected.—A. N. B.

The medical management of this institution, in the early part of 1883, was vested in a new medical board. This board, through its Executive Committee, of which we were both members, inspected thoroughly every part of this branch. We found much to condemn in the defective ventilation, heating, and plumbing. In our report to the Board of Managers these defects were pointed out, and means of remedying them recommended. But the occurrence of a malignant epidemic of measles at the country branch of this institution in the ensuing summer, and the more pressing need of sanitary improvements there, absorbed all funds applicable to repairs. The beginning of 1884, therefore, found the sanitary defects of the city branch nearly the same as at the inception of our service.

The natural outlet of the city branch being closed by reason of the recent epidemic at the country branch, its capacity was tested to the utmost. Rather than close the institution, a neighboring building was temporarily secured and furnished, and filled with waiting women, and a few women with their children. The cellar of this newly acquired building was damp and ventilation defective. It was, however, the best that could be secured in the emergency.

In April, 1883, at the beginning of my obstetric service, I requested of you, as the Sanitarian of the institution, official inspection and advice in the interest of the obstetrical department. . . .

You promptly made the inspection and indicated certain wards as being the best situated for obstetric use; approved of wire-woven beds covered with blankets without mattresses; disapproved of rubber sheets for protection, and advised the substitution of "Platt's chlorides" for carbolic acid for use in the wards. . . .

I concurred in your views. The use of the solution of the chlorides I was not acquainted with. I was agreeably surprised in the change in the character of the resulting antisepsis, having so long depended upon carbolic acid and iodoform.

. . . The conditions that afforded a fertile soil for the propagation of septic germs were: 1, the crowded condition; 2, defective ventilation; 3, the communication between the floors by the open spaces round steam-heating pipes; 4,

defective plumbing; 5, inability to alternate in the use of obstetrical wards oftener than once in two or three weeks, in consequence of the overcrowding. The history of the obstetric service in this branch, as far as I have been able to learn, is one of more or less frequent recurrenee of a mild type of sepsis, with an occasional severe or fatal case. In my service from April 1, 1883, to January, 1884, there were five or six mild cases, and one very severe, but not fatal case, following operative procedure.

Up to January 1, 1884, the practice had been to employ antiseptic douches three times a day, followed by antiseptic cleansing of person, all bed and body linen, and the wards, and scrupulous cleanliness.

Having in the past accepted the pathogenesis of puerperal infection as, in great part, autogeneric . . . as to the relative potency of the various germicides; the clinical view of this infection, as taken by the Obstetrical Section of the British Medical Association (*British Medical Journal*, August 11, 1883), effected a radical change in my pathological views of it and indicated a rigid and thorough antisepsis for its prevention and suppression, should it appear.

In November and December, 1883, puerperal infection seemed to burst out into an epidemic in this city and its neighborhood to so marked a degree as to precipitate papers and discussions from and by our best obstetricians and savants. . . . The problem in the discussion seemed to be "how to reduce the mortality," or the "treatment," rather than the etiology and pathology of the disease. . . .

With such timely warning we were anxious lest this infection should find access to our wards. *None but the attendants* were allowed to enter. Every precaution was taken to prevent the access from without, or outburst from within, as we thought. Our resident staff then consisted of but one, a female physician of three or four years' experience in the institution. . . . Having decided to adopt Dr. Garrigues' method of antisepsis (New York *Medical Record*, vol. xxiv., p. 730) as the most effective in its results, I was awaiting the addition of another physician to the house-staff before putting it in practice. On January 5th, at midnight, a mild case of puerperal infection was recognized on the third day of puerpurium.

There were two other puerperal women in the same ward, one of whom was in her fifth post-partem day, the other one in her sixth. The latter of these two was seized with the infection on her twelfth post-partem day, the former on her sixth. Of the three women, the first convalesced in five days; the second in nine days; the third died on the eighth day, her case being severe at the first and throughout. These cases were in the "isolated brick building"—exclusively used as a maternity ward.

On the day the third case developed (January 11th), I detected near one of the steam (heating) radiators an unpleasant odor, as of putrid animal matter. We immediately instituted a thorough search and found in the cellar a *dead and putrescent rat.*

Notwithstanding our pressing need of an additional house physician, we were unfortunately still unable to secure one. Between January 5th and February 12th, there were fourteen cases of puerperal infection. There were delivered in that time fifteen women, eleven of whom became infected, and three died—four deaths in all. During January we isolated every infected patient and treated them all antiseptically, according to Dr. Garrigues' method, except the "pad." There was rapid alternation in the use of the obstetric wards, followed by thorough disinfection with sulphur.

February 15th, all the waiting women, who had been kept in the temporary annex to the institution, were transferred to the country branch—the obstetric service having been suspended three days before.

February 1st, I suspended the resident physician from obstetrical service, though still unable to obtain an assistant. Having to treat both the infected and non-infected herself, notwithstanding the employment of the most careful and thorough antisepsis as to her person, I became convinced that she might be a carrier of infection. I assumed her duties, as far as the non-infected were concerned, for two days and nights. February 3d, having at last secured an additional assistant, I felt more hopeful of staying the epidemic; but in this I was disappointed, for every patient she treated became infected. The infection spread rapidly, and so virulent was it that out of fifteen women confined during thirty-seven days, eleven were at-

tacked and three died. In the last few patients only did I begin to use the obstetric "pad" of Dr. Garrigues.

It was impossible to secure hearty co-operation from this new assistant in the details of a thorough antisepsis. As she was but a temporary assistant I suspended the service, rather than assume any further risk.

The service being suspended the entire institution was *disinfected*—not "fumigated"—ward by ward, by burning sulphur, three pounds to every thousand cubic feet of space—all openings being carefully closed for twenty-four hours. This process of disinfection was repeated several times.

The nurses and resident physician disinfected all their clothing, and their persons, by washing and bathing; using for the former purpose a solution of *bichloride of mercury*, one part to the thousand of water, and for the latter, a solution of *boracic acid.*

The plan of antisepsis, as recommended by Dr. Garrigues, and adopted during the progress of the epidemic, consisted of the thorough use of *bichloride of mercury*, in solutions designated as number *one* and number *two;* the former of one part of bichloride of mercury to one thousand parts of water, and the latter of one part of the bichloride to two thousand parts of water. No. 1 was freely used externally, for sponging the patient or saturating cloths for external application, for washing the hands of the physician—using nail-brush—and with glycerine as a lubricant. No. 2, during instrumental procedure, and douche every four hours during labor.

The wards were sprayed twice daily with steam spray from a solution of Platt's chlorides. The floors were mopped up daily with No. 1 solution, and ten days was the limit for the use of a ward, when it was vacated and subjected to disinfection by sulphur fumes, in the manner already described.

The obstetrical service was resumed February 29, 1884, and up to September 1st, when my term of service expired, the health of the patients and inmates was most excellent. And for the purpose of this report, the resident physician writes me:

NEW YORK INFANT ASYLUM, HOUSE OF RECEPTION,
Sixty-first Street and Tenth Avenue, September 23, 1884.

DR. T. C. THOMAS—DEAR SIR: Our maternity wards were reopened February 29, 1884. From that date to Septem-

ber 1st there were ninety-nine deliveries. Of these patients, ninety-six had a normal lying-in, or to be more definite, everything went well with the first five patients confined. The sixth was admitted in labor March 16th, with marked œdema of the lower extremities. Her urine was one-half albumen. On the sixth and ninth days her temperature rose to 103°; this was considered to be due rather to her general condition than partaking of a septic element. Patient convalesced satisfactorily. Discharged, well, April 12, 1884.

A patient was confined April 16th, being the sixteenth case since the service was resumed. On her twelfth post-partem day she developed tenderness over the uterus, accompanied by pelvic pain. Temperature, 102.5°. Lochia normal as to quantity and odor. These symptoms were relieved by treatment in two days, Patient made a good recovery.

The only well-marked case of septic infection, during the time specified, occurred in a patient delivered of a still-born child, May 2, 1884. The girl was very anæmic upon admission, and, as I subsequently learned from the physician who had attended her, had a syphilitic history, to which undoubtedly the death of the child was due. It was much macerated, and, although an intra-uterine douche was given immediately, the temperature reached 101.4° on the night of her confinement. The disease was of a mild type, without other symptoms than the elevation of temperature, the highest being 102.5°. The temperature and pulse remained normal after May 26th.

The condition of our wards at present is very good.

Yours truly,

KATE PARKER, M.D.

There can be no more successful illustration of stamping out puerperal infection than this. That a dead and putrescent rat was the exciting cause—the importer of the *materies morbi*—under possible predisposing telluric and atmospheric conditions, I believe to be a fact. There were besides, unsanitary conditions, which you, as Sanitarian of the institution, corrected as well as you could; ventilated the cellars under the wards, improved the ventilation of the drains, and had the leaders (with their open joints and corroded holes opposite the win-

dows) disconnected from the sewers. It was all you could do, until the service was suspended and the wards vacated, when thorough disinfection was speedily accomplished.

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It has been demonstrated by statistics, that the price of success in the prevention and management of puerperal fever is an unremitting attention to every detail in antisepsis. The obstetrician always considers and examines all new methods in theory and practice, and weighs by the highest standards of his science the crystallized experience of the past. A satisfactory demonstration of their merits at the bar of the judgment of the profession will insure their acceptance and becoming a means to a higher and truer excellence.

THE ESSENTIAL CONDITIONS OF EPIDEMIC DISEASES, AND THE KNOWLEDGE AND MEANS NECESSARY FOR THEIR CONTROL.

To the foregoing special reports little need be said with reference to the recognized elements upon which efficient work for the control of the particular epidemics reported upon was based; or much added to show that on the same basis other epidemics are in like manner controllable.

The control of epidemic diseases essentially depends upon a knowledge of their existence, the conditions under which they are sustained, and the available means for their management. Hence it can hardly be regarded as any longer an open question in the United States, and certainly not in the American Public Health Association, that it is the first duty of every physician, on recognizing a case of epidemic disease, to report it to the sanitary authority. But it is the misfortune of some rare communities to have individuals in their midst who by resistance to the practical application of this knowledge, abet and encourage the existence of epidemic diseases under the pretext of maintaining private rights. To meet possible obstacles from this or any other cause, it appears to your reporter eminently proper that the duty of reporting epidemic diseases, and vaccination for the prevention of small-pox, should be placed upon the same plane as all other duties which have for their object the support and promotion of the public welfare—it should be made obligatory: *Salus populi suprema est lex.*

By the census of 1880 the number of deaths reported in the United States for the year was 756,893. Of this number 176,693 were caused by five of the most fatal epidemic diseases, namely: measles, 8,772; whooping-cough, 11,202; scarlatina, 16,416; enteric fever, 22,905, and diphtheria, 38,398. The number of deaths from small-pox and other less prevalent epidemics are not summarized in the census report. But from statistics which I have been able to obtain, with the kindly assistance of Dr. John T. Nagle, Registrar of Vital Statistics, New York, and other sources, the number of deaths from small-pox, in the chief cities of the United States for the year 1882 was 2,940, and in 1883, 1,058. Doubtless there were as many more, scattered throughout the country during the same period, which were not made the subject of official report.

It is safe to estimate that of the whole number of deaths in the United States in the census year, not less than 200,000 of them, or considerably more than one-fourth, were caused by epidemic diseases. How many of those deaths might have been prevented by the prompt report of every case on its occurrence to the sanitary authority, and by the timely vaccination of all those who, by this means, would have been fortified against small-pox, it is, under the circumstances, impossible to know. But, probably, as measured by the known results in places exempted from the prevalence of epidemic diseases by timely vaccination, by prompt notification to the sanitary authorities of all cases of epidemic diseases and energetic measures for their prevention, if the same means were made general throughout the United States, 100,000 deaths annually would be prevented.

In populous communities of civilized people everywhere in recent years, there are various organizations under laws and ordinances for the preservation of the public peace and the protection of property. Police and fire prevention organizations exist for the arrest of thieves, highwaymen, and incendiaries; and any person detected in being privy to the acts of such depredators is justly held as *particeps criminis*. Moreover, there are United States laws for the inspection of steam-boilers, for the prevention of overcrowding passenger vessels, etc., by which doubtless, many lives are saved. But as compared with the subject at issue: is there any member of the American

Public Health Association, is there any person worthy of the name of a physician; ay, is there any intelligent person throughout the whole extent of this country who does not know that the waste of human life due to the insufficient obligations for the prevention of epidemic diseases is many times greater than from all other causes combined? And is there any one who, in the face of such knowledge, would not cheerfully acquiesce, and heartily co-operate in the enactment of such laws and ordinances, national, State, and local, as shall have for their object the saving of 100,000 lives, and twenty times as many cases of illness annually in the United States?

If there are, indeed, any such persons, they are dangerous to the communities in which they live; more dangerous than the incendiary, the thief, or the highwayman, in the same proportion as the fatal epidemics with which they ally themselves are fraught with danger to the communities which tolerate them, more than all the other enemies of mankind put together. As physicians are usually the first to recognize the existence of an epidemic disease, laws for the notification of their existence to the sanitary authorities should be made especially applicable to them, but so worded as to make it a criminal offence of any one who knowingly secretes a case of epidemic disease under any pretence whatever; and the laws for compulsory vaccination, so conditioned in relation to the registration of births as to make it the duty of the sanitary authorities to see to it that every living child shall be vaccinated within six months of its birth.

The conditions under which epidemic diseases exist and may be assailed may be summarized as follows:

1. Every epidemic disease is due to a specific germ or active principle which exclusively propagates its kind.

2. The specific germs or active principles of epidemic diseases are never in total abeyance—they always exist somewhere—and are active under conditions favorable to their propagation.

3. The germs or active principles which are the specific causes of epidemic diseases are capable of multiplication in the human body.

4. The excretions from persons affected with epidemic diseases, and the dead bodies of those who have died of them,

contain the germs or active principles and may be the means of disseminating them.

5. The excretions and dead bodies of persons infected with the germs or active principles of epidemic diseases, may, by their manner of disposal, contaminate the air and the material substances of their surroundings, and the germs or active principles thus disseminated may lie dormant in the material surroundings of such excretions and dead bodies for unknown periods, just as the seeds of plants may lie without losing their vital properties, until awakened into activity by congenial conditions.

6. Epidemic diseases are portable with the persons, dead bodies, and material substances in which the specific germs or active principles by which they are caused are nourished and propagated.

7. In the words of John Simon: *The prevalence of external conditions tending in certain localities to determine a specific decomposition of excrement, communicable to other organic substances and infecting the air, is an essential element in an epidemic period.*

8. And finally, while the germs of all epidemic diseases have the common property of multiplication within the human body, some at least, and most notably cholera and yellow fever, have their great centres of multiplication elsewhere—probably subject to some specially intensified condition or conditions comprehended in the proposition just above quoted from John Simon.

The practical means for the management of epidemics deducible from the foregoing propositions are, for the most part, comprehended in the preceding special reports. It may be stated in general terms, however, that they imply competent sanitary authorities in every place, and such needful appliances to carry them into effect as may be made acceptable to all communities. But, it is the exigency of the hour, that there still exist in various high places persons in authority who are ignorant of, or purblind to all recent advances in the progress of practical sanitation.

That much-dreaded epidemic, the cholera, now on its way to this country, finds great cause for encouragement in the circumstance that, instead of complete isolation and care of those

affected with it, and the prompt disinfection of all things pertaining thereto, it is kept on public exhibition, and the material substances supposed to be infected are kept or placed under the most favorable conditions for propagating the poison.

On information gleaned from the foreign sanitary press, the cholera hospitals of France and Italy are places of public resort, and promenading through them by persons in no way connected with their management, of daily occurrence. First, the Government officials go round—it may be to see whether orders are properly executed—this would be well under proper restrictions. But next follow, or perhaps pass simultaneously, various persons, a prince, perhaps; the members of the Extreme Left, municipal officers of neighboring cities, a commission appointed by the Société Médicale on their own responsibility, journalists, consular reporters, newspaper correspondents, and curious persons, who return to their respective homes or hotels without change of clothing, to describe what they have seen.

Among the acts most commonly observed is the throwing of a few cupfuls of copperas or chlorine solution into the close stools, or sprinkling some of the same, or similar fluids, on the floors. At the outskirts—the depots of arrival for travellers, with little or no regard from whence—all new-comers are obliged to pass through an almost suffocating vapor of some kind, under the pretence of killing the bacilli Kochi lurking in their apparel or attached to the person. At some of the seaports in Italy and Spain, the ordinances of the famous Viscount Bernarbo appear to have been kept intact for the last five hundred years, and are practised now with the same diligence as they were in his day. All travellers, with their effects, are subjected to detention in uncleanly places—eminently promotive of the vitality of cholera, or any other kind of disease germs.

Meanwhile, at the ports of entry in those countries, as in the United States by order of the Secretary of the Treasury, cargoes of rags are retained on board vessels under the most propitious conditions possible for rousing into activity latent germs of every kind, but which otherwise—assuming their existence—with the rags, might be subjected to the process of conversion into paper, than which there is probably no more certain means of effecting their destruction; and the vessels being unladen, could be speedily disinfected. All these ob-

structive methods—and more of like nature might be added—would be ludicrous in the extreme if they were not dangerous, if they did not promote instead of prevent epidemic diseases.

The suggestions of this report are intended to completely controvert all such absurdities. Quarantines and cordons, in so far as they maintain mere detention without prompt and active measures for the care of the sick, protection of the well, and purification of infected material, deserve the reprobation of practical sanitarians everywhere.

We would have it understood that all diseases known as contagious, infectious, and endemic, are *epidemic* diseases; that exposure of the sources of epidemic diseases and the active principles or germs by which they are propagated to the free atmosphere is among the most powerful, and in some cases the only means necessary for controlling them; and that such exposure to the free atmosphere is, by means of tents, eminently practical and adaptable to all the required conditions—the complete separation and proper care of the sick from the well, of the family, the institution, the village or the city; and for the prompt removal of *all* persons from infected houses, vessels and places.

As for any measures with special reference to cholera, what has been said of the means necessary for the prevention and control of other epidemic diseases equally apply to it; and wherever these means are watchfully and energetically applied, we are confident in their efficiency against cholera as against other epidemics.

A. N. BELL, M.D.,
Chairman of the Committee.

NEW YORK, October 12, 1884.

"MANAGEMENT" OF CHOLERA IN EUROPE.

NOTWITHSTANDING the approach of winter, cholera continues to occupy a large share of attention in Europe, particularly in the countries bordering on the Mediterranean. The public, who are personally interested, view the situation in a variety of ways. The medical profession, whose duty it is, as far as possible, to arrest its progress, have agreed on *one proposition*

only: That it is an outrage on society, and really a barbarous act, to establish sanitary cordons on land.

The profession differ on many propositions; some think the disease contagious, others hold the contrary opinion; some think it infectious, others do not; again some think it the result of a certain kind of bacillus; others that this bacillus may be the product and not the cause of the disease; others, too, that the bacillus does not necessarily accompany the disease.

On the subject of contagion, Europe may be divided geographically into two sections. The northern, of which England is the most energetic member, includes North Germany and the Scandinavian States. To these may be added some partisans in France, and a few followers in Holland and Belgium. This condition was pointed out in THE SANITARIAN for June last, when the prediction of M. Fauville regarding the failure of the International Sanitary Conference of Vienna was quoted: "The reason is very simple—because the interests of the south of Europe are very different, in a commercial and sanitary point of view, from those of the north, and they could not, in consequence, act in concert in a convention in which those questions would be at issue. Thus it is evident the States of the north would place their commercial interests in the first rank, whilst in those of the south, sanitary measures would prevail."

There are two causes on which these northern nations rely for exemption from the disease: a cooler climate, and their remoteness from Egypt and the stations on the Red Sea. When the great moneyed interest and the extensive commercial relations involved in the interruption of free entrance into ports at which goods brought through the Suez Canal are usually delivered, are considered, it will not be unreasonable, perhaps not unjust, to assume that these powerful agents have much to do in influencing men's opinions regarding the importance of certain sanitary measures. The most serious objection advanced by the English papers against the existing quarantines is, that the Italian Government has been seriously affected by the loss of revenue from import duties. There are two considerations in this apparently simple statement. If the Italian Government has lost what may be called the *interest*, the English merchant has lost the *principal*. The same reasoning applies to Spain: "*hinc illæ lachrymæ.*"

The Spanish people are represented as clamorous for the removal of quarantine. This statement is overdrawn. The press, both medical and political, representing Barcelona, the commercial centre, and Madrid, the capital, urge the Government to persevere in the active measures adopted to prevent the introduction and farther spreading of the disease.

The venerable Jules Guérin has boldly advocated the opinion that cholera morbus and Asiatic cholera are essentially the same disease, therefore neither is contagious, and consequently quarantines are worse than useless. He cites certain phenomena that are common to both diseases and strengthens his assertions by the weight of his great experience, beginning with the epidemic of 1831, in France. In the peroration of his discourse before the Academy of Medicine, he expressed the hope that, as the authorities had proved the danger of sanitary quarantine on land, they would soon prove it equally objectionable for ships coming from foreign ports.

M. Leroy de Méricourt called attention to some of the extraordinary events that accompanied the progress of the disease in different places. During the war in the Crimea an epidemic occurred on board a French ship at Constantinople in which not one of those attacked had the slightest symptom of the premonitory diarrhœa upon which so much stress was laid. He cited the following: "A vessel was sent to remove four hundred and twenty soldiers who had been attacked with cholera; two hundred and twenty died on the passage, and yet only one sailor was attacked."

M. Rochard, with that clearness of arrangement, and an elegance of expression and force of reasonng peculiar to him, was the strongest opponent of the theories of Guérin. He carried his opposition into the International Congress at the Hague, and formulated the proposition which was adopted unanimously: "It is proper to continue the present system of quarantine with some modifications."*

Dutrieux-Bey, a Belgian, who is practising medicine in Egypt, was a strong advocate for the English view at the Congress. This discussion led the correspondent of the *Progrès Médical* to characterize the opinions of Guérin as "*Bizarres*,"

*("Il y a lieu de conserver, en l'améliorant, le système des quarantaines.")

ridiculous. The *Journal d'Hygiène* hastened to the defence of MM. Guérin and Dutrieux-Bey, declaring that the Section on State Medicine in the Congress which was charged with the decision of so important a question was incompetent because its number was not large, and there was not one delegate present from England or Germany, nor the Scandinavian States.

Here again the geographical line marked out in the opening paragraphs of this article is sharply and distinctly drawn. M. Ricord referred to some observations he had made in 1832, in the *Hôpital du Midi* in which he had six hundred cholera patients under his care. The cases were exceedingly violent, many of them dying immediately after admission. Of the other patients who were retained in the wards for treatment, not one was attacked. Physicians, students, and employés were exempt. During much of the time he gave his regular lectures on operative surgery, using, in most cases, for the purpose of demonstration, subjects that had died of cholera. His lectures were closed and his class finally dismissed by the authorities. Ricord is an anti-contagionist, and therefore opposed to quarantine.

Audi et alteram partem.

On the 26th of July last, Koch gave a very interesting address, accompanied with a series of experiments intended to show the process by which he arrived at his conclusions, to a select number of the most eminent scientists in Berlin. The details of this meeting were fully reported in the *Berliner Klinische Wochenschrift.* The mucus of the intestines to be examined was mixed with a minute quantity of peptone and meat juice, to which was added about ten per cent. of glycerine. A portion of this was spread on a slide, placed under a bell-glass, and left moistened to undergo the usual changes. The slides were finally examined under the microscope. The ætiology of cholera, he said, has made less advance than that of any other disease, because opportunities for studying it in Europe are rarely offered and few have examined it in India. It is claimed by some that cholera is a specific disease having its origin in India, while others believe that it may originate spontaneously in any country, and is not the result of a specific cause.

India was visited by Dr. Lacaze during the past summer,

and the result of his observations was given in a memoir read before the Medical Society, August 21st. The proposition discussed was: Is cholera due simply to atmospheric changes or to an animalcule propagated under certain favorable conditions? He visited the hospitals, both native and European, at Bombay. They are spacious, well kept, and well ventilated. The people have not the fear of the disease that is manifested in Europe. The natives, especially those in filthy districts, suffer most. The chief of the European hospital is a firm believer in the existence of a germ—*a microbe;* the surgeons, both native and European, in the Hindoo hospital hold the same opinions. The doctrine of Pasteur has more partisans in India than in France. According to the physicians the disease is propagated by the evacuations from the bowels.

Dr. Klein, of the English Commission, after assiduous investigations, and some experiments on his own person, decidedly opposes the theories of Dr. Koch—that the cholera is caused by the bacillus which Koch describes. Dr. Klein reports that he swallowed some of the mucus containing these bacilli, and after waiting ten days, experienced no ill effects; he, therefore, concluded that the disease is due to some other cause.

It would be difficult to imagine anything more unsettled than the question regarding the essential nature, origin, and mode of propagation of cholera. It is well to look at all sides of the question and observe all the pitfalls in the way, if we wish to form reasonably intelligent theories by which we may be guided when the disease visits this country.

T. P. CORBALLY.

THE CHOLERA IN NAPLES.*

THE history of the present visitation has several features of unusual interest. When the first case occurred, although the course of the disease was closely watched by the entire population, and the man died, the physicians reported, after a post-mortem examination, that the symptoms did not exclude the

* From a letter to the London *Standard.*

suspicion of cholera, but they declined to be more precise. Two more cases followed, and special precautions were taken, but still the dreaded word "cholera" was not pronounced. Forty-eight hours elapsed without a new case, and press and people in great glee declared that the *zingaro*, as the cholera is called here, had no chance in our well-protected city. This being so, the people regarded with jealousy the disinfection of several places, and especially the cleansing of the infant school rooms; and hence the riots occurred which have been reported. The population celebrated their supposed escape from the epidemic by feasting on figs, prickly pears, melons, and had wine all day on Sunday. Then on the Monday morning there could no longer be any doubt the *zingaro* was amongst us, and had made havoc of eight victims during the night, while forty others were attacked. The authorities were now on the alert; the hospital at Cannochia was ready with one hundred and fifty beds. If only the sick of Porto, Mercato, Pendino and Nicaria could be got to leave their slums in order to be cured, the general opinion was that all would soon be over. All energy was directed to these shamefully neglected quarters. Sig. Matteo Schilizzi, a noble philanthropist, of whom humanity may be proud, was the first, accompanied by a physician, to enter the foul courts, called *fondaci*, in search of the sick. Money was the key to their doors, and with it he went largely provided. Every spoonful of medicine he gave the patient would only take after being bribed with five francs, and after the good man had first tasted it himself. A much larger sum had to be spent to persuade the patient to go to the hospital and to provide for his family during his absence, and thus thousands of francs were expended in one morning.

Such was the beginning of the cholera at Naples. No one would have noticed any difference in the usual aspect of the town up to the 5th and 6th inst. The promenades and drives were well frequented; even the theatres were moderately full—a medicine gladly taken by the Neapolitans, and highly commended as tending to induce an easy mind. Now, however, our poor city wears a sad aspect indeed. Many theatres are closed, the actors having fled. No carriages are to be seen in the Corso; the cafés are empty at 9 P.M.; what vehicles one meets are funeral cars, and in the low quarters are laden with

four or six coffins at a time. The few people seen after midnight hold some sweet-scented herb to their nostrils to ward off infection.

I was attracted to the Vico Violari one morning while visiting the quarter by the frantic cries of a woman who rushed out of her room on the ground floor, calling out: "Don't speak to me of miracles! No miracles!" A crowd of neighbors instantly collected, and I learned that the poor woman had just lost a grown-up daughter by cholera. The people pushed into the room, full of curiosity, to see the corpse, while the mother continued to rave against the saints. I heard that the young woman had been ill for four days. She might have been saved if she had been taken to a hospital, but when I suggested this to a bystander he said: "If we must die, we must, either here or there. There is no help for us till the 19th (the feast of San Genuaro). San Rocco has this time been powerless; only San Genuaro can do it." Just opposite the scene of the mourning a man was seen in convulsions on his bed, some people watching anxiously at the door. They were waiting for the priest bringing the holy sacrament to the dying man. When the priest came in sight all the people, unmindful of the state of the road, knelt in the street, and with them the bereft mother. The room in which the man was dying was fetid in the extreme, and so small that there was scarcely room for the officiating priest to perform his sacred rites. Nevertheless, boys and girls pushed in behind him, utterly without fear of infection. No doctor was to be seen. As I left the quarter of Pendino I met an omnibus converted into a funeral-car, full of empty coffins, a load of coffins with corpses being ready to be taken away in exchange.

As long as they continued the processions gave some animation to the streets, the young women, with their long, dishevelled and generally beautiful hair, looked highly picturesque, but their chanting of the rosary in nasal tones was very doleful. These processions were headed by rather suspicious looking youths, who solicited contributions from the passers-by or induced the people at the windows to throw down coppers. Bags full and handkerchiefs full were obtained in this way, but the objects on which the money was spent were not very clear. The revival of saints' pictures, long forgotten under the mortar

of many houses, and particularly at street corners, formed for a day or two another source of movement and even disturbance. Large and eager crowds, chiefly of women and children, watched for the reappearance of their favorite saints, and one could not behold their sincere joy and delight when at last the image appeared in wonderful preservation, without respect for their religious feeling. Lamps were immediately hung around and candles placed before such images, beneath which a small table was placed upon which coppers were dropped to pay for oil and candles. At night loud and fervent prayers were repeated before such shrines. In such times of revived bigotry it would fare ill with any one who should refuse to lift his hat in passing, nor was it wise to refuse a copper. The police, who sought to interfere with these illegal demonstrations in the streets, did not move, although the cardinal was not in favor of the excitement, but the authorities were evidently determined not to embitter the temper of the already greatly tried people.

The audacity of the women was wonderful. They were the ringleaders in the riots on account of the fumigation of the infant schools. They stood bravely against a squadron of cavalry the other day, when they prevented the carrying of stretchers through Chiaja, holding a big stone in one hand, and generally a baby on the other arm—perhaps their greatest safeguard. On the evening when the fearful figures of nearly one thousand cases and three hundred deaths were published a deep gloom extinguished the last signs of life in the streets. Everything was abandoned. Most of the well-to-do fled to the suburbs. Lodgings on the hills of Posilipo and the Vomero were secured at exorbitant prices, the bands ceased playing in the public gardens, and Naples lay for days under a deep cloud.

VIN MARIANA.—I have for the last eight or ten years often recommended the "Vin Mariani" to patients laboring under abnormal conditions of the system, requiring a mild tonic and stimulating influence, with marked and excellent results. For convalescents also, I consider it a very useful remedial agent. J. M. CARNOCHAN, M.D.

M. MARIANI, PARIS, August 29, 1884.

SANITATION OF THE MISSISSIPPI VALLEY.*

By G. B. Thornton, M.D.,

President Memphis Board of Health and Member of Tennessee State Board of Health.

This subject is introduced at the present meeting of this Association more with the object of awakening an interest in it among sanitarians, and to elicit a discussion on it at this meeting, than with the hope of doing it justice in the time allotted for the preparation of this paper, which was interrupted both by ill-health and business engagements. Presumably there are a number present who reside in this valley, both of the laity and medical profession, engaged in public health affairs, who are conversant with its sanitary defects and needs, and either directly or indirectly interested in all things pertaining to its welfare. Moreover, as the science of civil engineering enters so largely into the discussion of this question, it would afford an opportunity for gentlemen of that profession, members of this body, to give their views on this important subject. No section of country in America, of the same extent, offers a more interesting field for study to the sanitarian, or greater necessity for practical sanitation, than this; none more worthy of consideration as a question of political economy, involving larger interest as a question for State and National legislation. Take, for example, the vast area known as the Mississippi River Bottom, lying between the 37th and 29th parallels of latitude, which would be from Cairo to New Orleans, or to the Gulf Coast, a distance of 500 miles direct, or about 1,000 miles by river, embracing a territory of 32,000 square miles, which includes, besides many rich sections, the Yazoo Delta of about 4,000,000 acres of alluvium, capable of producing as much corn and cotton, its staple products, as the same area in the world. It is estimated that if this delta

* Read before American Public Health Association, St. Louis, October 15, 1884.

is completely protected from overflows and brought to its full productive capacity, it would yield about one-half the present cotton crop of the Cotton States, and corn enough to supply the labor necessary to its cultivation. There are other sections of the Mississippi Delta and its tributaries as productive as this at present, only partially opened, heavily timbered, in some places covered by dense canebrakes, the richest of all lands, and interspersed with lakes and bayous as valuable as this, subject to the same obstacles to settlement. These lands are mostly alluvial bottoms, with some few exceptions, subject to annual overflows when not protected by levees, and full of all kinds of insect life incident to a damp, warm atmosphere, a heavy foliage, and dense undergrowth. While there are tracts of this country open and in a high state of cultivation, with all the necessary comforts of living, many places that were once in cultivation from force of circumstances have reverted almost to their original wild state, though new lands are constantly being opened, and the whole area in cultivation is now greater than ever before.

This whole country is the true habitat for all malarial diseases—malarial fevers of every grade, from the ordinary intermittent to the hemorrhagic type, or malarial hæmaturia, as it is commonly called—which are phases of development of a chronic malarial toxæmia, characterized by structural changes of the constituents of the blood, the most difficult to treat successfully, and fatal type of malarial poisoning, and nearly all accompanied with more or less congestion and enlargement of the liver and spleen. A common sequela of this chronic malarial poisoning is an anæmic condition and dropsical effusion. Hepatitis, resulting in hepatic abscess, another sequela of the malarial toxæmia, occurs, perhaps, more frequently here than in any other locality in the country. This is not a metastatic abscess, the result of inflammation or suppuration in some other part of the body, or of traumatie injury or dysentery, which is sometimes associated with hepatic abscess, but a direct result of an abnormal condition of the liver caused as above stated. The pathology and therapeutics of these diseases not coming within the province of this paper, I will not discuss them.

These fevers are endemic throughout this whole section,

and other diseases not peculiar to this locality are more or less complicated by the same influences causing them. There is a marked difference in the susceptibility to this malarial influence between the white and negro races. The former is much more susceptible than the latter and does not stand exposure here so well during the summer and fall months. The negro race seems by nature peculiarly well adapted to this climate, and as a consequence constitutes the great mass of the laboring population. In a paper read before this Association on "Negro Mortality" in October, 1882, and published in vol. viii. of its "Transactions," I discussed this subject, and consequently will not dwell upon it now.

Owing to the facilities for transportation afforded by these great water-ways, the Mississippi River and its tributaries, which are now supplemented by railroads, through commercial intercourse, this valley as other parts of the country has been visited several times since its settlement by the two most destructive and dreaded of all exotic or importable diseases—cholera and yellow fever. Neither has ever found a permanent lodgment in it to be called into activity by any climatic conditions without fresh importation when once eradicated.

It is through this vast and important country that State medicine or public hygiene may demonstrate its greatest triumphs, and its devotees prove to the world the practical good claimed for it as a part of just State government and advanced civilization. The sanitation of this valley embraces three propositions: The reduction to the minimum the causes producing the malarious atmosphere, the improvement in the present methods of living, thereby increasing the resistive powers of individuals to malaria, and the prevention of the introduction by importation of the infectious diseases above mentioned. The efforts made to prevent the importation of yellow fever along the Gulf coast during the past four summers, I think, prove very conclusively that this disease can be kept out of the country by proper care and vigilance.

It has been demonstrated too often to admit of controversy that large areas formerly almost uninhabitable have been so improved by drainage and cultivation as to be not only habitable but highly productive. Surface drainage, though essential through this whole delta upon the largest scale, does not alone

answer for drying the soil and removing the causes of malaria. The process of evaporation from a spongy and absorbent soil is too slow when such an excess of moisture is to be disposed of during the hot season to prevent the atmosphere from being damp and humid. Much of this dampness can be prevented by lowering the ground water by a system of underground drainage after the surface water has been disposed of. Without going beyond our own country or citing examples from either ancient or modern history, many of which could be given, I will mention the State of Indiana, with which doubtless some present are familiar, as affording a striking illustration of the beneficial results upon the public health of surface and underground drainage of wet and marshy districts. Many localities in that State, where malarial fevers prevailed to such an extent as to retard settlement, have been rendered healthy by thorough drainage for agricultural purposes. It is an open question whether or not extensive overflows cause an increased amount of sickness over those years not marked by such general and long-continued overflows. There is a difference of opinion among those who should be authority on this subject, and no records from which one year may be compared with another to determine even with approximate accuracy the difference, if any, in the sickness following these extraordinary inundations.

My own opinion is, there is so much swamp-land and malaria-producing element throughout this whole bottom country, independent of what are commonly called general overflows, that there is no material difference. Some years are more healthy than others owing to a difference in atmospheric conditions independent of their local conditions. For example, the summer of 1878 seemed to be particularly favorable to the spread of yellow fever through the whole valley country and far beyond any influences of the malarial districts. This disease that year, as is well known, extended to and spread rapidly through communities along the line of railroads which were notably healthy and free from local causes to produce disease. Dr. Stanford E. Chaille, of New Orleans, addressed a circular letter to a number of physicians in Louisiana after the great overflow of 1882 to ascertain if there was any marked increase of sickness in that State attributable to that overflow. His correspondents differed, but there was not sufficient evidence to

justify the opinion that there was. He concludes his article as follows: "In the meantime it is satisfactory to find that the evidence thus far collected indicates that overflows do not cause inevitably or generally any notable increase of malaria or any other disease, and that they certainly do not usually either cause or promote epidemics. Therefore the direct influence of overflows on health is not usually dreaded" (*New Orleans Medical and Surgical Journal*, June, 1883). Malarious diseases being pre-eminently the type of disease which prevail most constantly through this whole delta and which offer the greatest barrier to its development, the local sanitary work required should be such as would prevent or reduce to the minimum the influences causing such disease.

There are no official statistics outside of a few cities in this valley, and they afford no adequate index to the general health conditions of the bottom country from which to obtain information as to the death-rate or comparative loss of labor among the resident white and colored population from these diseases. They prevail mostly at a season of the year—latter part of summer and fall—a season when the dews are heaviest and exposure to them, for those who work in the fields, seems unavoidable, is attended with greatest danger. This is a period when labor is in greatest demand to gather the crop and perfect the year's work. The loss to the material wealth and possible resources of the country is not alone to be considered in estimating the death-rate, but also in the great loss of time caused by enervating sickness at the most critical period of the year when the greatest exhibition of endurance is required to resist this malarial poison.

The three conditions essential to the production of this malarial atmosphere are heat, 67° to 70° F., a permanent moisture and vegetable decomposition, or emanations of a like deleterious character from the soil, paludal or marsh miasma, or, as it is more succinctly stated in Wood's "Practice of Medicine," heat, moisture, and vegetable decomposition. Remove either element, and, the conditions being disturbed, malaria is not produced. At present these conditions prevail through this whole bottom country, modified or lessened in some localities by improvements, cultivation of the soil, and drainage.

The first essential step toward prophylaxis is to reduce to the minimum the two elements which are to some degree controllable; that is, the moisture and vegetable decomposition, or the miasmatic emanations from the soil.

The seasons being immutable the heat cannot be modified. Civil and sanitary engineering can so dispose of the water distributed over this country by the excessive spring floods and annual rainfall as in a measure to control this element.

This would require an effective system of levees, canals, reservoirs, for holding back the water from the upper tributaries, and increased rapidity of the outflow of the Mississippi, thereby preventing or diminishing the dangers incident to the more tardy process of evaporation.

The third factor, decayed vegetable matter and the deleterious elements of a fresh soil, are in process of being removed by the constant clearing and cultivation of lands for agricultural purposes. The process of building levees, draining bayous, lakes, and stagnant pools, and removing the deleterious ferments of the soil by cultivation, is a slow process toward the sanitation of this vast delta, though it is in process of being done, and in course of time will no doubt be accomplished.

In the meantime it is well to consider the best methods for the preservation of health in the face of these opposing elements.

The resistance to malaria can be very materially increased by improved methods of living over the existing methods among the masses of the people, and especially among those unacclimated.

The system can be so fortified as to resist much more effectively the depressing influences of this climate. By these methods are meant all the domestic comforts pertaining to good living. Wholesome food properly cooked, pure drinking-water, which can only be obtained here by good cisterns; comfortable houses, two stories when practicable, and the upper rooms to be used as sleeping apartments; suitable clothing, a more general use of light flannels next the person, especially by those exposed to dampness; keeping out of the night air and the more malarious localities when the system is most impressible to this atmosphere; a strict observance of temperance in all things, especially abstinence from common

whiskey, the social beverage of this country. It is reasonable to suppose that a country of the natural fertility of this delta, settled as long as it has been, would be occupied by a population possessed of all the essentials requisite for good living, and observing those rules of individual hygiene best adapted to their surroundings. While there are those who possess all necessary domestic comforts and observe those habits of life best for the preservation of health, and as a consequence enjoy as good health as others in more favored localities, this class is exceptional, and only proves the value of local sanitation and proper hygienic observances in individuals. To leave out of consideration this limited class, who may seek more salubrious localities when occasion demands it, it is so generally conceded as to justify the assertion that there are fewer home comforts enjoyed by the mass of the population of this valley than that of any of the same extent and value in the Union. The class of people who seem to me to be the greatest sufferers from climatic or local influence are the white laborers from Northern latitudes, generally Europeans employed by contractors to build railroads and levees through these bottoms. These people are unacclimated, their accommodations for sleeping are of the cheapest and most primitive character, indifferent log cabins or temporary rough board shanties for convenience' sake located near their work.

Their food is of a coarse character, poorly cooked, the drinking-water, one of the greatest essentials to good health, is taken from the bayous or lakes full of organic impurities, of itself sufficient to cause sickness.

Memphis has afforded hospital accommodation for this class of people for years; numbers of them seek relief there during the latter part of summer and fall, all affected in the same way, with violent remittent or intermittent fevers, sallow complexions, generally with enlarged livers and spleens, and their symptoms characteristic of intense malarial poisoning, or, as it is commonly called by them, the "swamp fever." I am informed by a large contractor of many years' experience as a railroad and levee builder in this bottom, that he cannot work to an advantage white labor after the advent of hot weather. Negroes are then the best, they seem by nature to be peculiarly well adapted to this country for all kinds of laboring

work. One attack of malarial fever does not afford protection to the system from successive attacks, but there is a degree of acclimation or the accommodation of the system to these climatic or paludal conditions, which has its value or influence in giving endurance and affording to some extent powers of resistance.

This may be attributable to the natural adaptability and instinctive promptings of man to accommodate himself to his surroundings whether in an arctic or tropical latitude.

Now that Congress has expended five millions of dollars to deepen the mouth of the Mississippi River for commercial purposes and enable the largest class of ocean-going vessels to come up to New Orleans, and has recently made large appropriations to be expended under direction of its River Commission, for building levees to protect lands from overflow, as well as other engineering work for the protection of property from the caving of banks, this subject has more than a local interest.

These great annual inundations seem to be getting more formidable and difficult to control every succeeding year than formerly. This is due, no doubt, to the increased clearing of lands in the country above, which causes a more rapid melting of snows, and increased discharge of all upper rivers after the heavy rains of spring.

Protection from these great inundations is not only of vital importance to those residing in and having all their interest in this valley, but becomes, in a measure, a national question, as no one State is able to cope with it as a whole, but all local sanitary work, such as draining of swamps, bayous, etc., also the preservation record from which vital statistics could be had, should be done by State, county, and municipal authorities.

The Hon. Mr. Ellis, of Louisiana, very justly said in his speech before the Forty-fourth Congress on this subject, in advocacy of Congressional aid for the protection of this delta: "Congress alone has that power."

This great delta is the geographical centre of the agricultural and commercial interest of this country, and as a pure question of political economy, when protected and brought to a proper standard of public health preservation by local sanitation, will contribute more to the commerce and general wealth of

the nation than the same extent of country in the Union. The practical question is what are the best and most speedy methods for accomplishing this great work.

Civil engineers, who are alone competent to decide this, differ very widely on many points, but all seem to agree upon a general system of levees supplemented by other plans as auxiliary.

Mr. A. G. Warfield, Jr., civil engineer, who accompanied the River Commission above alluded to, submitted a report on this subject to the Congressional Committee which had it under consideration, which in my judgment is the most exhaustive and able report yet made, and the study of which would repay any one interested in this question. His summary is briefly as follows:

1. Reservoirs at the head-waters of the tributaries of the Ohio.
2. Straightening the channel by judiciously located cut-offs.
3. Closing of crevasses and bayous or forced outlets.
4. Erection of levees.

The tabulated statements from the Signal Service Bureau, showing annual rainfall and temperature from Cairo to New Orleans, embracing the whole cotton belt of the Mississippi Valley, are omitted.

RELATIVE MORTALITY OF THE WHITE AND COLORED RACES,

As Illustrated by the Mortality in the City of Richmond in the Years 1882–83.

By JOHN N. UPSHUR, M.D., Adjunct Professor of the Practice of Medicine, Lecturer on the Diseases of Women and Children, Special Course of Practical Medicine, Medical College of Virginia, Richmond, Va.

IN the Transactions of the Medical Society of Virginia for 1872, there is the report of a committee on the anatomical, physiological and pathological differences of the white and black races, and the modifications of the treatment of the diseases of the latter rendered necessary thereby, and in 1873 a supplemental report, the late Dr. Thomas P. Atkinson, honorary fel-

low, being the chairman of the committee, and the reporter in both instances.

He there deals ably with the question referred to the committee, and gives some very interesting facts—facts which, in the main, sustain the conclusions arrived at in the following paper, from observations made during the ten years succeeding the above report. He was severely reviewed. We know of no reason why some of our Northern brethren should not pay us the same compliment, but we would suggest in the outset a possible lack of familiarity with the habits and experience in the treatment of the diseases of the negro race.

The last census of the United States, it is claimed, shows that the relative increase in the negro race is greater than that of the white. This we deny, and believe can fully prove to be a fallacy, arrived at from conclusions based on a false premise. We have before us the report of the Board of Health for the city of Richmond for the year 1882, and a synopsis of that for 1883. Knowing the fidelity and ability of the gentleman who presides over this department, and the interest and zeal with which he ever prosecutes his work, we can vouch for the accuracy of the report.

In the outset, we regret that we have not the report for the ten years immediately preceding, as we feel assured it could but give emphasis to the report of the years 1882–83.

We assert, without fear of contradiction, that in no city of the country, North or South, is the negro more favorably surrounded and circumstanced, is more thrifty or happy, than in this city, and in none does he live on better terms than here with the white race.

His condition being favorable, makes the difference in the mortality but the more striking.

Now, as we recede from the days when he was a slave, the race becomes more delicate. Why? Because, as the property of his master, if for no other cause, he was well-housed, clothed, and fed, nursed tenderly and faithfully in sickness, and attended by the best medical skill. Exposure in bad weather was reduced to a minimum. The fat bacon and corn bread he ate, and homespun clothes he wore, were powerfully antagonistic to scrofulous and tubercular disease; and these, when occurring, were to be seen in some innocuous form of external

scrofula, consumption, and the more fatal forms of tubercle, as compared with the present day, were *nil.*

The writer, a few years subsequent to the war, was the resident physician in a large freedman's bureau hospital near this city. *To find an exception to the existence of tubercle even where not suspected before death was very rare, and the number of forms in which this malady existed was positively startling*, especially when the *obstinacy with which it yielded to treatment* was considered.

Another fact, cancer in various forms, and syphilis, are only less fatal to the negro than tubercle.

My experience in the practice of medicine for more than fifteen years tends to prove that *the race does not possess the same resistant power to disease, or readiness of response to remedies, as the more favored white race.*

In the condition in which we now find him, he is but poorly clad, insufficiently fed, and improperly sheltered, in many instances overworked. The climax of happiness to him is to be a member of a society which will give him a big funeral when he dies, and be able to go on an excursion whenever he pleases during the summer. The dues to the one, and the expense of travelling on the other, consume very much of his earnings while summer lasts, and winter finds him almost destitute of food, fuel, and warm clothing.

Their impecuniosity deprives them of the best medical skill when sick, or, if they obtain good medical care, it is not beneficial, as they can't get the comforts and necessities demanded for the successful management of disease.

We believe that the conclusion of an increase in the negro population is arrived at from a false premise. Those who were *grown when the war ended are more hardy than those since born*, and consequently longer lived. *The greater part of the mortality now comes from the younger negroes, and those who attain adult life do not possess the physical stamina which will make them a long-lived people, and the succeeding generation will be feebler still, of necessity.*

The number of deaths in Richmond for the year 1882 was 1,855—white, 792; colored, 1,061—a difference greater than at first appears, because the excess of the white population over the negro is more than eight thousand, the rate *being*

19.80 *per thousand for the white and* 37.89 *per thousand for the colored.*

Again, there were births—white, 970; colored, 885—of which there were still-born, white, 50, colored, 97.

These figures are very striking, especially so when we remember the great prevalence of criminal abortion among the colored population and their unwillingness, under the new state of things, to have children. Consequently, many cases of premature and still-births occur which are never officially reported.

Of deaths under five years of age there were 697; white, 273; colored, 424. Now add to this 97 still-births, and we have 521. Leaving a net increase of only 364 from the birth-rate in children, under five, let us see what diminution further of this number we have from the deaths under thirty years, and we have a net increase of only 146; and if we look further, we find a mortality of nearly a hundred more before the average of human life of the present day is reached. Let us compare the white population with this statement:

There were 970 births—from which take 50 still-births and 273 deaths under five years—total, 323; net increase, 647. Further diminution up to thirty years, and the net increase is 501—a difference by no means accounted for by the excess of 8,000 in the white population over the negro; and during the next decade the difference in the number of population being still borne in mind, the mortality of the white race is actually only a little over three-fourths as great.

Now let us look at the causes of mortality. Take tubercular disease, including under that head death from tubercle in all of its forms.

There were 42 more deaths among the negroes than whites; and here the excess of the white population must be again called to mind to give the greater death-rate from this cause its full import. Now let us see how the results for 1883 foot up as compared with the preceding year. The total number of deaths for 1883 was 1,839—less than the year before; whites, 777—less than the preceding year; colored, 1,062—*an increase* of one. Rate of mortality per thousand, about the same as for 1882.

Total number of deaths under five years, 751—white, 274;

colored, 477. Total number under thirty years, 1,098—white, 397; colored, 701. Deaths from consumption and other tubercular diseases—whites, 114, colored, 194.

To us these figures are significant, and speak trumpet-toned in confirmation of the relative mortality of the previous year. It is to be regretted that we have not been able to get the number of births for this year, but the inference is that the figures comparatively are the same as for the year 1882.

Finally, let us look at the mortality for six years in the two races and we find an aggregate excess of mortality for the negro race of 1,441.

We quote from the Compendium of the United States Census for 1880, 2d part, p. 706, in substance as follows:

"In the Southern States, lying east of the Mississippi River, which have the largest colored population, we find the death-rate, 14.04 per thousand white—17.22 per thousand colored. In this section of the country the deficiencies in the enumerator's returns of deaths are probably the greatest, and they are also probably greater among the colored than among the white population. The difference of mortality among the white and colored is especially well marked in the Southern States, *and is largely due to the relatively greater number of deaths among infants of the colored population.*"

In conclusion we desire to call especial attention to what we think we have proved—first, *in fact a greater mortality;* second, *diminished length of life;* and lastly, *that in consequence of his change of condition and attendant circumstances, that with each succeeding generation there is progressive enfeeblement of the race.*

We know full well that it will be urged that the condition of the colored race in the city argues nothing as to its condition in the country, where there is every condition of a better hygiene. We admit that to the same extent it does not, but so far as the benefit of medical attendance in the country is concerned his means there for treatment in disease are no better than in the city; and the tendency of the race now is towards migration to the towns and cities, believing that they will thus benefit their condition. It is not hard to see that in this the rule is disappointment.

It is our desire to look at this question from the highest

standard of humanity. We wish well to our sable friends, and would rejoice to see them prosperous and happy in their proper station; but much thought and close observation, for many years, force us to the belief that in time, a few generations at farthest, the place which now knows the colored man will know him again no more forever.

The hand of fate is upon him; and while the ultimate result may be retarded by an improved hygiene, yet there lurks in his frame the seeds of disease, enfeebling his constitution and diminishing his resistance to disease, till, feeble and blighted, he will cease to be, except as a memory of the past.

As we see him in his home, in sickness and in poverty, our most sincere commiseration is excited, and we can but wish his fate had been a happier one.—*Atlantic Journal of Medicine.*

THE LAST SCENE IN GREELY'S TENT.

FROM the official report of Commodore Winfield Scott Schley, of the expedition for the relief of the Greely party, we extract the following description of the scene inside the Greely tent:

"Lieutenant Greely was found in his sleeping bag, his body inclined forward and head resting upon his left hand. The book of common prayer was open and held in his right hand. He appeared to be reading prayers to Private Council, whose condition was most desperate and critical. He was cold to the waist; all sensation of hunger gone; was speechless and almost breathless; his eyes were fixed and glassy. Indeed, his weakness was such that it was with difficulty he swallowed the stimulants given him by Drs. Green and Ames; his jaws had dropped, his heart was barely pulsating, and his body temperature very low.

"This tender scene of a helpless, almost famished officer consoling a dying companion, was in itself one that brought tears to the eyes of the strongest and stoutest of those who stood about them on the merciful errand of relief.

"Sergeants Brainard and Fredericks and Hospital Steward Bierderbick were extremely weak and hardly able to stand; they were no longer able to venture away from their camp to seek food nor to prepare the simple diet of boiled sealskin, nor

to collect lichens, nor to catch shrimps, upon which they had to depend to a great extent to sustain life. Their faces, hands, and limbs were swollen to such an extent that they could not be recognized. This indicated that the entire party had but a short lease of life, probably not more than forty-eight hours at most. This fact was recognized by them all, and had come to them from their experience during that long and desolate winter in watching their dying companions as one after another passed away from among them forever.

SERGEANTS ELLISON AND LONG.

"Poor Sergeant Ellison was found in his sleeping bag, where he had lain helpless and hopeless for months, with hands and feet frozen off. Strapped to one of the stumps was found a spoon, which some companion had secured there to enable him to feed himself. His physical condition otherwise appeared to be the best of any of the survivors, and this may be attributed to the fact that each of his companions had doled out to him from their small allowance of food something to help him, on account of his complete helplessness to add anything to his own by hunting about the rocks for lichens or shrimp. He suffered no waste of strength by exertion incident thereto. This care of Ellison was such as only brave and generous men, suffering with each other under the most desperate circumstances, could think of.

"Sergeant Long was very much reduced, though in somewhat better condition than some of the others. His office of hunter for the starving party had made it necessary to increase slightly his pittance of food to maintain his strength, that he might continue the battle for food and life to the helpless. In his case, however, the effect of this continued effort had told its story in his wasted form. Shorter and shorter journeys were made in good weather, while in the frequent bad weather of that region his strength was so much impaired that when the joyful signal whistle was heard he had only enough left to stagger out to the rocks overlooking the water to see if the signal heard had proceeded from ships in sight. His first visit was a bitter disappointment, as he saw nothing. A second visit, fifteen minutes later, brought him within fifty yards of the Bear's steam cutter and in view of the relief ships coming around Cape Sabine. When the steam cutter ran into the

beach where Long was seen he rolled down the ice-covered cliff and was taken into the cutter. He informed Lieutenant Colwell that the location of the camp was just over the cliff.

DEATH OF ELLISON.

"In the case of Sergeant Ellison the medical officers were fearful from the first that his chances of life were very small. As soon as healthful food was available and the digestive functions should be re-established fully the healthful round of blood circulation would begin its distribution of new life to the injured parts, and inflammation would naturally occur. If Ellison's strength should increase more rapidly than the inflammation, amputation of the injured parts would perhaps save his life. Several days after his rescue, June 28th, Dr. Green reported that Ellison was threatened with congestion of the brain. The symptoms increased rapidly until the poor fellow lost his reason. At Godhaven his condition was so critical that the surgeon of the expedition, after consultation, determined to amputate both feet above the ankles, as the only chance of life left the sufferer. Disease, however, triumphed, and amid the bleak scenes that had surrounded him for three years in his heroic sacrifice, and within the desolate solitude of that region of everlasting ice and snow, surrounded by his sorrowing comrades, he passed away about three A.M. of July 7th, three days after the amputation.

GREELY'S CONDITION.

"Lieutenant Greely was physically the weakest, but mentally the most vigorous of his party. He had lain in his sleeping bag for weeks on account of his gradually failing strength. He was unable to stand alone for any length of time and was almost helpless except in a sitting posture; all pangs of hunger had ceased; his appearance was wild; his hair was long and unkempt; his face and hands were covered with sooty black dirt; his body was scantily covered with worn-out clothes; his form was wasted; his joints were swollen and his eyes were sunken.

"His first inquiry was if they were not Englishmen, but when he was told that we were his own countrymen he paused for a moment as if reflecting, then said, 'And I am glad to see you.'

A TERRIBLE SCENE.

"The condition of his camp was in keeping with the scene inside the tent, desperate and desolate; the bleak barrenness

of the spot, over which the wild Arctic bird would not fly; the row of graves on a little ridge, 100 feet away, with the protruding heads and feet of those lately buried, a sad but silent witness to the daily increasing weakness of the little band of survivors; the deserted winter quarters in the hollow below, with its broken wall invaded by the water from the melting snow and ice above it; the dead bodies of two companions stretched on the ice foot that remained; the wretched apology for cooking utensils improvised by them in their sore distress hardly deserving the name; the scattered and worn-out clothes and sleeping bags of the dead; the absence of all food save a few cupfuls of boiled sealskin scraps; the wild and weird scene of snow, ice and glaciers overlooking and overhanging this desolate camp, completed a picture as startling as it was impressive. I hope never again in my life to look upon such wretchedness and such destitution. The picture was more startling and more deeply pathetic than I had ever dreamed could be possible. In beholding it I stood for a moment almost unmanned, and then realized that if the expedition had demonstrated any one thing more than another it was that an hour had its value to at least one of that party. Stouter hearts than mine felt full of sorrow. Eyes that had not wept for years were moistened with tears in the solemnity of that precious hour, in the lives of that heroic little band of sufferers, until this moment so hopeless and helpless.

CONDITION OF THE DEAD BODIES.

"In preparing the bodies of the dead for transportation in alcohol to St. Johns, it was found that six of them: Lieutenant Kislingbury, Sergeants Jewell and Ralston, Privates Whisler, Henry, and Ellis had been cut, and the fleshy parts removed to a greater or less extent. All other bodies were found intact. When the bodies of the dead were exposed in preparing them the identification was found to be complete. Some of them could be recognized by aid of a picture taken with us from home; others, whose features had decayed, were identified by other characteristics. I am, therefore, satisfied that no mistake was made in this important matter, which so impressed us from the beginning."

STATEMENT RELATING TO THE INTERNATIONAL COLLECTIVE INVESTIGATION OF DISEASE PROPOSED AT THE INTERNATIONAL MEDICAL CONGRESS AT COPENHAGEN.

THE General Meeting of the International Medical Congress, held at Copenhagen on August 14, 1884, upon propositions made by Sir James Paget, Professor Ewald, of Berlin, Professor Bouchard, of Paris, and Dr. Billings, of Washington, passed the following resolutions:

1. That an International Committee be formed for the Collective Investigation of Disease, in connection with the work of the International Medical Congress.

2. That the following gentlemen do represent their respective countries thereon:

As representatives of Denmark—
Professor TRIER, of Copenhagen.
" C. LANGE, "
As representative of Scandinavia—
Dr. E. BULL, of Christiana.
As representative of Russia—
Dr. RAUCHFUSS, of St. Petersburg.
As representatives of Germany—
Professor EWALD, of Berlin.
" BERNHARDT, "
As representatives of Austria-Hungary—
Professor SCHNITZLER, of Vienna.
" PRIBRAM, of Prague.
To whom was added by co-optation—
Professor KORÁNYI, of Buda-Pest.
As representative of Switzerland—
Professor D'ESPINE, of Geneva.
As representatives of France—
Professor BOUCHARD, of Paris.
Dr. LÉPINE, of Lyon.
As representatives of Great Britain and Ireland.
Sir WILLIAM W. GULL, Bart.
Professor HUMPHRY, of Cambridge.
Dr. MAHOMED, of London.

As representative of British India—
Sir JOSEPH FAYRER, K.C.S.I.
As representatives of the United States—
Professor JACOBI, of New York.
Professor N. DAVIS, of Chicago.
As representative of South America—
Dr. GUTIÉRREZ-PONCE, of Paris.
As Secretary-General—
Dr. ISAMBARD OWEN, of London.
Representatives of other Countries to be hereafter appointed.

In accordance with the following resolutions of the first meeting of the above Committee, held at Copenhagen on the following day, viz.:

"That the Secretary be instructed to prepare a statement as to the objects of the Committee, for translation and publication in the journals of the various countries represented;"

I beg leave to submit the following statement to the members of the medical profession of.....

ISAMBARD OWEN,
Secretary-General.

5 HERTFORD STREET, MAYFAIR, LONDON.

The main objects which the Committee seeks to attain through the collective investigation of disease are to widen the basis of medical science, to gather and store the mass of information that at present goes to waste, to verify or correct existing opinions, to discover laws where now only irregularity is perceived, to amplify our knowledge of rare affections, and to ascertain such points as the geographical distribution of diseases and their modifications in different districts. It will be its endeavor to place clearly before the whole profession the limits and defects of existing knowledge, as well as to stimulate observation, and to give it a definite direction. It will be a not unimportant incidental result of its work should it tend, as is hoped, to the better training of the members of the profession in habits of scientific and practical observation, and in systematic methods of recording the facts which they observe.

The age in which we live has seen enormous advances in the sciences on which the fabric of medicine rests, such as Chemistry and other branches of Physics, Physiology, and Pathology. Each of these has taken giant strides. It must

be admitted, however, that purely medical knowledge has scarcely made proportionate progress. It cannot be expected that it should do so, as it deals with the aberrations of the most complex of organisms, is of all sciences the most difficult, and demands the greatest patience and the largest accumulation of data.

Hitherto the advancement of medical science has been brought about mainly by individual effort. The value of such work in the past we in no way underrate, nor do we desire to lessen the amount of it in the future; but in medical science there is much that defies interpretation from individual experience, and many problems so far-reaching in an ever-widening field, with elements so manifold, that no single man, however gifted and long-lived, can hope to bring the whole within his range. The need, therefore, in medicine, of that combination and concentration of individual work which is adopted in many other branches of science and in commerce, and to which increasing facilities of intercommunication have given so much impulse and so much strength, cannot be questioned. Indeed, it may be said that, resting on individual research alone, medical knowledge can be advanced but slowly and with difficulty. Future progress to any great extent must be the work, not of units acting disconnectedly, but of the collected force of many acting as one. For many to act as one, organization is needed; that organization it is the purpose of our Committee to supply.

Disease is many-sided; and we wish to include in our organization those who see it from every side. All, therefore, whether hospital physicians, family and school attendants, specialists, medical officers of the Army and Navy, and of workhouses and asylums, will be asked to contribute their quota of observation to the common fund.

In England and in Germany organizations for this purpose already exist, through which good work has been accomplished; and a volume entitled the *Collective Investigation Record*, containing tabulated returns, with reports upon them and other matter, is published annually by the British Medical Association. France and Austria are alive to the importance of the new method. In Scandinavia and in the United States, the foundations of associations have been laid. Denmark, Russia, and Switzerland are setting their hands to the task.

To unite these several associations by an international organization for the study of various problems, and to induce the formation of similar combinations elsewhere, is felt to be a work peculiarly befitting an International Congress. Our Committee is enjoined by the Congress at Copenhagen, to endeavor to carry out this work, and, in compliance with that injunction, it invites the co-operation of all who have at heart the promotion of medical science and practice.

The following is the proposed method: A subject having been selected, a person or persons of acknowledged authority will be asked to write a memorandum, in the form of a short essay, upon it. The memorandum will succinctly give the present state of our knowledge. It will also point out the directions in which further research may best be made; and, with this view, will suggest a few simple and definite questions upon the subject selected. The questions will relate to matters of fact, to be elicited by observation of cases, rather than to matters of opinion.

The contemplated organization will, it is hoped, in time enable the Committee to ask and collect answers to these questions from the profession at large wherever scientific medicine is studied or practised. It will be a further duty to examine, arrange, tabulate, and deduce results from the mass of observations thus collected, due credit being given to each contributor for the information he has furnished; and reports on the results of the several investigations will be laid before the International Congress at its next meeting at Washington.

REGULATIONS GOVERNING THE HEIGHT OF HOUSES.—The number of dwelling-houses in Paris is about 90,000. The area of the whole city is twenty-five square miles, and the population over 2,000,000. A recent measure of the Council d'État ordains that henceforward no flats shall be less than eight feet high; that in streets twenty-five feet wide the height of the houses must not exceed forty feet; in streets between twenty-five and thirty-two feet wide the height must not exceed fifty feet; in streets between thirty-two and sixty-five feet wide the height must not exceed sixty feet; in streets above sixty-five feet wide the height must not exceed sixty-five feet, and no buildings are to have more than seven stories, all included.

THE SQUALID DWELLINGS OF THE POOR—A SOCIAL AND SANITARY REPROACH.*

By C. W. CHANCELLOR, M.D., Secretary of the State Board of Health of Maryland.

CARELESS manipulation in the prosecution of an analysis may adulterate a long and laborious investigation, but the disappointment occasioned by such a failure can only be measured when we know the practical consequences of the genuine result. In studying the laws of dead matter, an ungrounded conclusion will seldom endanger life, or induce sickness; in ascertaining the weights and distances of the heavenly bodies, the discrepancy of a few grains or inches can never be a fatal error.

Mind may be analyzed according to the taste of the metaphysician, and dissected into five or fifty rudimental principles; stars may be weighed by avoirdupois or apothecaries' weight, as it may suit the fancy of the astronomer, and the world may stand forever marshalled into two or more conflicting sects on any abstract question of theoretic science, without involving in their differences the welfare of a single interest, or the safety of a solitary individual. But in a science having for its objects the prevention of disease and the preservation of health—of all desired objects the most desirable—the simplest theory cannot be indulged in without involving a thousand lives. A random step upon such sacred ground must lead to danger, may lead to death. The lives of our fellow-creatures are the material we experiment upon, their happiness or misery is the issue to which every experiment must tend. A faithless rule or fanciful theory may occasion a widespread and woful pestilence. Reasoning, therefore, in such a science should be conducted on the most rigid principles, and the chaste prose of sober truth should never be adulterated with the meretricious poetry of drunken fancy.

A careful consideration of the dwellings of the poor in

* Read before the American Public Health Association, St. Louis, Mo., October 14, 1884.

crowded cities has led to this admonitory preface. It is an important question, involving the very essence of urban sanitation, and as the points about to occupy attention relate immediately to this question, and its bearing upon the public health, we are anxious the public should look with their own eyes into the consequences of the evil, in order that they may see the exceeding hazard which its continuance must occasion.

Were the extent of disputed territory limited to a few inches or a few feet, the value of conquest might be of little importance; but it is a wide and spacious interval which is the subject of contention. The grand point at issue is not a verbal difference, or a conventional technicality; it is an important practical question. It is whether we shall continue to maintain in our cities and villages the most fruitful source of zymotic fever—a disease which spares no age, nor sex, nor condition—which comes into our families unseen and unprovided for—which creeps from house to house with noiseless progress, and covers entire districts with death and desolation—it is whether such a monster can be more effectually killed by being starved or by being fed?

If an investigation should be carried on, and a report made upon the unsanitary condition of the dwellings of the poor in our large cities, it would reveal a frightful picture of misery and vice, fitted to excite and shock humanity. Public inquiry would show these dwellings to be an infamy to civilization—places where no care can protect their occupants against disease; where sobriety and decency are physical impossibilities, and where men, women, and children are smothered in filth and vice. A writer in an English paper, calling attention to these habitations a short time ago, says that in them "disorder is perpetual and disease never absent. At times whole streets are blockaded, as it were, against the police, and then a pandemonium of violence proceeds unchecked. Every Saturday and Sunday the inhabitants of these 'rookeries' give themselves up to a drunken orgie, and scarcely a week passes without some shocking crime is perpetrated, thus demonstrating the connection between filth and immorality."

If we turn our eyes to the condition of these dwellings in our own country, and the forlorn condition of those who occupy them, we are at once impressed with a melancholy

conviction of how little has yet been done to improve the lot of the great mass of the human race. Modern ages have witnessed the growth of many sciences to maturity, of some to perfection. Mathematics and chemistry, the most complete and extensive, as well as the most valuable instruments by which the dominion of man has been extended over the powers of nature, have long attained a degree of certainty, beyond which their advancement may seem rather an object of curiosity than of use. Every branch of physical knowledge has been explored with a success that has seldom failed to reward the toil of the inquirer; the art and science of logic and the philosophy of mind have long assumed their places in the rank of exact sciences. The effect of this advancement of knowledge has been for ages apparent, and is daily more obvious in the increase of wealth, the multiplication of securities against evil, and the production of fresh means of enjoyment; but in the distribution of these good things, a very small class of the community lays claim to a lion's share, and the poor "are sent away empty." It is plain, therefore, that none of these are the sciences by which the misery that has always marked the lot of the lower classes can be removed. It is equally plain that to the discovery of the means of removing it the resources of the human mind should be intensely applied. To such discoveries we look forward with confident hope, but this hope is founded solely on the expectation of the diffusion of sound principles of hygiene.

The principal sources of happiness are the social affections; but the man whose thoughts are perpetually harassed by the torment of immediate, or the dread of future want, loses the power of benevolent sympathy. Another result of suffering is that it produces an extraordinary greediness for immediate gratification; a violent propensity to seek compensation from any sensual indulgence which is within the reach. As a consequence the poorest individuals in civilized society are generally the most intemperate; the least capable of denying themselves any pleasure, however hurtful, which they can command. Hence their passion for intoxicating liquors.

There is really no *a priori* cause why the poor more than others should be addicted to intemperance, unless it be a sense of their own misery, superinducing a condition—a disease it

may be called—which craves for stimulants. It might be well if our social reformers would regard the prevailing intemperance of the laboring class from this point of view, for it is quite certain that it is an incredibly fruitful, if not the chief source of it. Our great industrial class is entitled to be cared for and protected both as to their health and the pursuit of their avocations. They are the backbone and sinews of the nation's strength.

We cannot consider here the loss, in an economical point of view, from intemperance. It would amount to many millions of dollars. But what of the useless waste of life and its attendant sickness; of the consequent impoverishment, pauperism, and demoralization, and the increasing legacy of hereditary disease? There are two primary and fundamental considerations upon which natural stability and permanency rest. The first regards the health of the people, the other their education. Any system of government without full provision being made for these will be incomplete; and in regard to the former, the best guarantee of a nation's security will be wanting. Therefore, above all things, let no government, in its administrative capacity, be without a health department, presided over by wise and energetic health officers, whose supreme duty it shall be to vigilantly administer laws, the aim of which shall be to protect the health of every citizen, and especially to surround that of the dependent, industrial population with every possible safeguard.

A nation such as ours, of fifty-five millions, with a vast manufacturing industry, a busy and flourishing commerce, and a large agricultural and mining interest to attract the most vigorous and enterprising of our people, cannot afford to waste the lives of its citizens. Are not labor and capital the two pillars upon which a free country rests? Disease paralyzes labor and wastes capital. It ought then to be the primary object of an enlightened government to prevent disease, preserve health, and prolong life; to maintain the whole people in a condition of the highest efficiency, alike for the labors of peace, and the struggles of war.

Though "social reform is in the air," never before was the misery of the very poor more intense, or the condition of their daily life more hopeless or more degraded than at the present

time. There is a boundless field for the labors of the philanthropist, and it does seem strange that, while the sufferings of the heathen in distant lands should unfailingly touch a chord of enthusiastic generosity in the hearts of all religious sects, the mission at home should awaken the coldest response. The courts and alleys of our crowded cities too often furnish a spectacle of squalor and misery which is a disgrace to our civilization, and should arouse public misgiving and inquiry. It is here that persons must come who wish to see for themselves what destitution and degradation really are. It is here that the fever dens are to be found which figure so largely in perfunctory official reports. Here reside a population which is a people in itself, ceaselessly ravaged by fever; plagued by the blankest, most appalling poverty; cut off from every grace and comfort of life; born, living, and dying among squalid surroundings, of which those who have not seen them can form no adequate conception. The atmosphere in these courts and alleys is in almost every case foul in the extreme; and in the houses, unless one has a very strong stomach, it is difficult to remain for a minute, so intolerable is the stench.

These houses are filled with women, and diminutive urchins "engaged in the pleasing occupation of stirring around the filth in a sewer with their fingers." They evidently know what they are born to experience, and deem it advisable to accustom themselves to dirt and bad smells at as early an age as possible. They will declare "there is no sickness in the house," when you know certainly to the contrary. A further inspection reveals the fact that in an upper room, on a bundle of filthy rags in one corner, the eldest son perchance is "down with the fever," and in another, on a still sparser supply of rags, a little girl—it may be she is fast dying of diphtheria. Mark Twain once declared that he had been up a mountain so high that he could not tell the truth on the top of it. You will readily perceive that the people who occupy these dwellings are so poor, so dirty, so degraded, and so low in the scale of Christian civilization, that they cannot tell the truth; and if you should stay long enough amongst them, you would soon begin to entertain doubts of your own veracity.

The vast wealth created by modern progress has run into the "pockets" of the fortunate few; but the great majority of

the "toilers and spinners" have derived no proportionate advantage from the prosperity which they have helped to create. It is true that many members of the working class who have the moral and intellectual qualities essential to material success have had their full share in the prosperity of recent times. Numbers of them have risen, and others will rise into the rank of capitalists; but there is good reason to believe that the lowest dregs of the population in large cities are constantly exposed to the direst extremities of want and suffering, a circumstance which affects injuriously their life, their health, and their prosperity. There must, moreover, always be a residuum in any community—recruited frequently from higher classes, as the inevitable penalty of individual vice, recklessness, or calamity—which no amount of general prosperity, no ingenuity or drastic severity of legislation can wholly extirpate; but much is to be gained by grappling, in a proper way, with the evils which actually exist. The wretched dwellings of the poor, together with poverty, ignorance, and crime, are a chief incident in the general condition of this class. These various factors are interdependent, and any one may be the determining cause of the others. The remedies, therefore, must be as manifold as the disease.

With regard to the direct and immediate means of dealing with the evils of overcrowding in the dwellings of the poor, Mr. Chamberlain, of England, goes to the root of the matter, and speaks out with uncompromising plainness.

In the first place, he would have the authorities proceed on the assumption that houses which are unfit for habitation are public nuisances, and that the community in such cases should justly compel the owner to put them in proper condition, or require them to be closed or demolished.

It is certain that much more is capable of being done than has yet been undertaken, to require the owners of these shameful dens of vice and disease to keep their property in good sanitary condition. If overcrowding were strictly prohibited under the penalty of a heavy fine, it would seem that all these nests of crime and misery might be at once closed out, and their re-establishment in other localities be prevented by the due enforcement of proper regulations.

For this purpose municipal authorities must have the hearty

and consistent support of public opinion. When property takes alarm the outcry which it makes is deafening. Personal interests can generally take good care of themselves; it is the public good which is so often powerless and voiceless in presence of the audacity of private wrong. A municipal government charged with the protection of these undisciplined and disorganized natural rights has no chance against the eager, persistent, and vociferous clamor of the vested interests with which it has to contend, and the experience of health officers, in their endeavors to enforce the most moderate precautions for the preservation of health and the safety of life, has not been encouraging.

Whenever, for the purposes of sanitary improvements, or where property has been declared unfit for human habitation, it has been necessary for the authorities to interfere, the owner generally obtains from the public, under the guise of compensation, amounts altogether and demonstrably in excess of the market value of the property, even on the most favorable computation. Surely the sound principle in such cases should be the real value of the land and buildings, used under legitimate conditions, and not the exorbitant value arising from criminal practices. For example: There is a certain class of property found in unhealthy, crowded areas, and used for immoral purposes actually prohibited by the law; but the illegal occupation is the justification of the exorbitant rents demanded from the wretched occupants by the persons who trade in their vices. A house which for honest occupation is worth $200 a year will bring in double or treble that amount to an owner who winks at the traffic which it is permitted to shelter.

When this house is required by the municipal authority, the demand for compensation is based, and often allowed, on an income which represents, not a fair return for an investment, but the profit on complicity with vice. The same result obtains where tenements which could properly accommodate a single family are made to do duty for three or four times as many persons as can be decently housed in them. The income derived is proportionally increased, and compensation follows as a premium on evil practices. In this way a premium is offered for neglect and wilful indifference to sanitary provisions. It is a question simply between the rights of property and the

rights of the community, and until this fact is faced, no reform is possible; and it may be laid down as the principle of future effective action that to make certain localities in cities habitable for the toilers who live in them, the expense must be thrown upon the property owners.

When these owners, not satisfied with reasonable rents and the increment which the general prosperity of the city has created, obtain exorbitant returns from their investment, by permitting arrangements which make their property a public nuisance and a public danger, the State is entitled to step in and protect the citizen, paying only such compensation or damages as will fairly represent the worth of the property legitimately used. It is very well worth the while of the public to face this question and solve it. It would be of great benefit to all, and especially to the working population. It is not only a waste of life, but a waste of money, to educate the growing population and send them to live in such miserable dens as they are often obliged to live in. The welfare of society demands that this matter of the housing of the poor shall be trifled with no longer. Public opinion is beginning to assert itself, and the prospect of action draws nearer daily.

The following project of a law is presented with the hope that, if applied, it may effect some good in promoting sound and trustworthy ideas upon this vitally important question, and bring within closer range the possibility of thoughtful and effective action. It possesses not only a large element of intrinsic justice, but if enacted would have the effect of placing upon the owners of unsanitary property a responsibility which undoubtedly belongs to them, and would be incalculably more effective in rectifying the evils of overcrowded tenements than all the "peddling" legislation of municipalities, or an army of sanitary inspectors.

1. The law should make it an offence punishable by heavy fine to own and rent property for habitation which is unfit for the purpose.

2. Local authorities should have power, subject only to appeal to the courts of proper jurisdiction, to close such property, or to make, at the expense of the owner, such alterations or repairs as may be ordered by the sanitary officer. The property to be closed during litigation.

3. When necessary to acquire any property or destroy any building for the purpose of preserving or protecting the public health, or for any sanitary purpose whatever, the local authorities should be empowered to acquire the said property or destroy the building, without the city having to pay more than a fair market value for the same, to be settled by proper arbitration, but in no instance should the value assessed be greater than the seller could obtain in the open market from a private purchaser, with no allowance for prospective value or compulsory sale.

Provision should also be made to prevent owners from exacting extortionate prices for their tumble-down houses, often bought for speculating upon the necessities of the city or community.

4. The owner should be required to prove before the arbitrators, not what the nominal rent is, but what the actual rent received during a given period has been, and the amount of purchase-money may be estimated on that basis, unless the house has been used for improper purposes, or by too large a number of tenants.

5. The valuation should be made in every case, where an agreement cannot be arrived at between the parties, by official arbitration, and no appeal should be allowed from the decision.

6. The scheme of improvement should include any surrounding property which will be benefited by the reconstruction of the unhealthy area, and the confirming order should authorize a rate to be levied on the owners of such adjacent property, fairly representing the appreciation of their holdings by the proposed improvement.

7. The cost of any scheme for the reconstruction of an unhealthy area should be levied on all owners of property, including long leaseholders within a certain district to be determined by the arbitrators; but if the improvement is essentially local in its character, and the nuisance is created solely by the condition of one or more houses, the cost may be thrown entirely on the owners of such house or houses.

The effect of these or similar provisions would be simply that improvements on a large scale, and in every large town, could be undertaken by the authorities without fear of excessive cost. This is the age of municipal reform and enterprise,

and there is not the slightest doubt that local authorities would, under these conditions, joyfully embrace the opportunity afforded to them, and that they would quickly put an end to the scandal and disgrace which has at last forced itself on public attention, and alarmed and shocked the public conscience. It remains to be seen whether practical effect can be given to the only measure which affords hope of permanent relief. Political power is the means to the end of solving some of those social questions, which intimately concern the welfare of the masses of the people, and in the settlement of which they have a just right to make their voices heard.

CARPET-BEATING.—We have no wish to decry this periodic purification, but merely to point out rules for its better conduct and efficiency. The usual process in households which cannot afford to have it carried out by special agency is first to take up the carpets and sweep the walls and ceilings, and then to wash the floors. While the latter are drying, work must be found for idle hands, and they cannot be better employed than in beating the carpets in the court-yard or back garden, a work attended with a horrid din and cloud of dust. It will be unavailing, we know, to complain of the noise—no appeal in this direction will gain a moment's sympathy; but we hope more attention will be paid to the other nuisance. When we reflect on the nature of the dust thus raised, we are surprised that sane persons allow to be thus stirred up under their noses all the nauseous accumulations of dining-room, bed-room, and stair carpets, to say nothing of door-mats, etc., into a fine dust, and which, thus dispersed, finds its way again into our houses in a form most readily accessible to our respiratory organs. Indeed, it is fortunate if the dust thus roused is only nauseous and not infective, since the desquamated cuticle of scarlet fever, the scabs of small-pox, the dried sputa of consumptive or whooping-cough patients, living parasites, and hairs from mangy cats and dogs may thus invade our rooms.

THE FOOD WE EAT, THE LIQUIDS WE DRINK, AND THE ADULTERATIONS WE SUBMIT TO.*

By Hon. Erastus Brooks, Member of the State Board of Health of New York.

If men are fearfully and wonderfully made there is nothing more marvellous in the form of this creation than the character or substance of the food they eat. In this food there is carbon serving as a fuel for the support of animal life; and carbon with hydrogen, oxygen, and nitrogen, make the four essential elements of human life. Phosphorus, sulphur, chlorine, sodium, potassium, calcium, magnesium, iron, and fluorine are but of secondary importance among the primary elements. In all these, which the animal and vegetable kingdoms provide, the sustenance of our daily existence is found. They give strength to the limbs, flesh and blood to the frame, and muscle to the whole body.

Carbon, with a little hydrogen and oxygen, the chief constituents of our food, compose the alimentary support found in butter, suet, and in all these fatty or oily elements which become part of every healthy life. The flesh, blood, and bones need the phosphates derived from animal and vegetable food. The iron in our blood is obtained chiefly from the meat we eat, and traces of iron are found in milk, eggs, and in almost all kinds of vegetables. The elements I have named are parts of one great whole, and in the food we eat their mixture is necessary to prevent waste and decay. Using any one of them alone, which is almost impossible, as the combination is practically a necessity, the human system would lose about all its forces.

These elements make blood and cause nutrition. There is in them the power of respiration, and there is no real life without them. The saccharine qualities, as water and sugar, the oleaginous representing butter, the nitrogenous representing albumen and salts, the aqueous representing water and

* Abstract of a paper read before the American Public Health Association, St. Louis, Mo., October 15, 1884.

other fluids, include and conclude all sources of supply. Water in quantity, if not in variety and quality, holds all these elements. Nine-tenths of the milk we use is water. Uncooked beef contains seventy to eighty per cent. of water, and many vegetables have even a larger percentage of fluid; but while this is true, milk is almost the only fluid that supports the human body. This fluid, besides holding water in greater proportions than almost anything else, represents sugar and casein, which, in close alliance with albumen and butter, represent in food what is oleaginous. The proportions of these ingredients in human milk are ten parts of casein which makes blood, ten parts of butter or fat, twenty parts of carbo-hydrate or sugar and a tracing of salt.

For infants and adults alike, physiology has proved in recent experiments that casein and albumen are the essential producers of blood, and we all know what this fluid performs in the work of rebuilding and strengthening the human frame.

The combinations of the several groups of human food are: Aqueous, saccharine, oleaginous, albuminous, gelatine, and saline. The best recognized teachers of the qualities of food remind us of what is necessary to make up the deficiencies in the wear and tear of life, if we would preserve the necessary fires of animal existence. With constant waste in one direction, the necessary daily food to prevent this decay is required as the needed balance to preserve life.

Digestion depends largely upon what we eat. The quantity is oftener too much than too little. In the army and navy, in the hospitals and prisons especially, the quantity is prescribed by pounds and ounces and based upon the work done by the consumer, and Mr. Brooks gave the quantity of food used in various prisons, used by the Esquimaux, and other classes and conditions of people. The proper cooking of food is one of the fine arts, and very often the mental happiness is largely dependent upon well-cooked food, and the important and essential part of a wise domestic home is the kitchen.

The most palatable and beneficial of our varied kinds of food is milk. Adulterations are found in much that we eat, drink, and wear; and, as a general rule, we may abandon all stimulants and most condiments, except when prescribed by a physician.

The extent of food adulterations is one of the worst signs of the times. No country is free from this public evil, and it is next to impossible to reach and punish these abuses. Coffee has been adulterated until in some instances there is not an ounce of coffee to the pound, and three-fourths of the teas sold have been impure. Milk is adulterated in many ways, and some of them are very injurious. Spices are notoriously largely adulterated. The adulteration of drugs demands the attention of the health authorities. In spirits, especially in wines, the adulterations are much worse than in coffee, or general articles of food, and in 1881 fifty-six per cent. of 3,361 samples of wine examined were found bad, and six per cent. dangerous. Butter should come from the dairy and not from the fat of animals; and in New York forty millions of pounds have been sold in the State in a single year. In Bavaria recently an inspection resulted in the condemnation of thirty-three breweries, and in fines ranging from $50 to $250 each, and three other brewers were sentenced to eight months' imprisonment. Glucose may be harmless enough, but when thirty-five and fifty per cent. are mixed with honey and maple sugar, the deception is palpable and flagrant. Most kinds of oil are more or less impure, and the chief fraud is in calling oils by wrong names. Cheese is adulterated with potatoes or bean meal, and the rind has at times blue vitriol and arsenic to give it the appearance of age. Other poisons are used to give the cheese a biting flavor; lard cheese is made at twenty-three factories in New York. Sugars are much less adulterated than formerly, and adulterations are now limited more to glucose than formerly.

There are before me authorities showing the extensive and carefully planned adulterations in butter, alum, borax, barium, curd, fats, flour, gypsum, lard, lead carbonate, lead chromate, yellow potato flour, salt, sodium, silicate or soluble glass, soapstone, starch, etc. French, German, and English authorities name all these uses and abuses. Lard or cheap fats are common adulterations in England as in the United States. The letters of W. A. Croffutt show loads of sacks filled with peas and beans, ground and sold for coffee, and the sweepings of factories used to adulterate ginger. Two-thirds are impure to one of the pure articles retained. Old boots and shoes literally pass through the heat of the hottest ovens to be mixed

with pepper, and old tannin, removed as a nuisance, is ground into cinnamon. This class of domestic manufactures simply forbids all additional comment upon what at times is thus made and sold.

Finally, there is no more reason in truth—and there is much less reason in fact—why food adulterations should be more tolerated or excused than adulterations in gold or silver or the use of counterfeit money in coin of any kind. What is sold as food to eat or as coffee, tea, cocoa, beer, or wine or more stimulating spirits for drink, should be pure. The gold when adulterated for purposes of science or manufactures should state the grains of pure gold in the coin or in the article made, whether in jewels or any other thing manufactured. The same at least should be true of the silver dollar coined at the mint and of every article of silver. Even more should this be true of what we eat and drink.

I am not surprised, however, to hear the Federal Government cited as a successful example of adulterated money by those who practise the manufacture and sale of tainted and adulterated food and drugs. We cannot always control the Government, but we can at least insist that the manufacture and sale of adulterated food and medicines shall be exposed to the public eye and punished by public law.

SUCCESSFUL YELLOW FEVER INOCULATIONS.—A correspondent of the *Medical News* writes that in the Paris papers of November 11th, appeared the following:

"In yesterday's session of the Academy of Science, M. Bouley, Vice-president, entertained his colleagues with a discovery of great importance. Since 1880 M. Domingas Freire, Professor in the Medical School at Rio Janeiro, has occupied himself with the question of yellow fever inoculation. He has even made several communications on the subject to the Academy of Medicine. He had not been able to demonstrate the microbe of yellow fever, but ascertained that the virus, of whatever nature it may be, had been attenuated, and that guinea-pigs had acquired immunity.

"Since then, a Frenchman, M. Rabourgeon, a pupil of Chauveau, Pouchet, and Pasteur, had been called by the Emperor

Dom Pedro, to found a veterinary school at Rio Janeiro. He started supplied with all the necessary apparatus for the study and culture of microbes.

"Domingas Freire and Rabourgeon then united their efforts to solve the question. After having carefully experimented on guinea-pigs with the attenuated virus, they inoculated themselves as well as several students of medicine and employees of the Museum at Rio. They underwent the symptoms of mild yellow fever which disappeared in three days.

"The Emperor Dom Pedro visited the laboratory, and having satisfied himself of the excellent results of their method, authorized them to experiment on human beings. Nearly two hundred persons, most of whom were wharf-laborers, submitted to the vaccination and remained unaffected, while around them were large numbers of their comrades succumbing to the disease.

"English sea-captains sailing in these latitudes, learning that yellow fever was epidemic at Rio Janeiro, had all their crews vaccinated, first setting the good example themselves.

"The description of the microbe will eventually be published. Meanwhile it is certain that the attenuated virus has preserved about five hundred animals and human beings, who had submitted to the vaccination.

"These happy results must be compared with the report made by Dr. Rochard, that of twenty-five physicians sent to Senegal to care for the yellow fever patients, twenty-three had soon died, and the conclusion is near that this vaccination is destined to save the Europeans who visit the places where yellow fever is endemic. We are happy to see, adds one of the Paris newspapers, that one of our countrymen, a pupil of our own savants, is among the new benefactors of mankind."

DR. J. K. BAUDUY, of St. Louis, Superintendent of St. Vincent's Institution for the Insane, and author of the excellent article on INSOMNIA in the November number, will please pardon the printer for calling him "Bandy." Accidents will happen, sometimes, to the best of printers.

EDITOR'S TABLE.

AMERICAN PUBLIC HEALTH ASSOCIATION, TWELFTH ANNUAL MEETING, ST. LOUIS, MO., OCTOBER 14–18, 1884. THIRD AND FOURTH DAYS' PROCEEDINGS.

(*Continued from November Number.*)

THE SANITARY CARE OF STOCK IN TRANSPORTATION, by Dr. W. B. Conery, of the State Board of Health of Missouri, was the first paper, after the morning hour's devotion to miscellaneous business. The object of the paper was to present a few suggestions on the dread pestilence among our cattle, commonly known as Texas, Spanish, or splenic fever. The germs of the disease have their origin and are propagated among Texan cattle, and are communicated to our northern hoofs by them. The number of animals shipped annually from the ranches of the West to the great cities of the interior and seaboard is enormous. The distance travelled is so great that the journey, under the most favorable circumstances, would be attended with most insuperable hardships. As it is actually performed, it is accompanied by extreme suffering from want of food, drink, and space. The cattle endure the agonies of a two weeks' journey in midsummer, suffering from hunger and thirst in sight of green fields, rivers, and lakes. It is a common occurrence for cattle to be shipped from St. Louis to New York with but a single rest during the entire journey. The cars should be thoroughly cleansed and disinfected after every loading and shipment, and under no circumstances should they be overloaded or the animals crowded together. Such transportation renders animals unhealthy and causes much of the disease now prevalent. Fresh water, air, and salt-pans should be accessories of cattle cars, and the animals should be daily inspected, and the wounded and broken down should be removed. There must be a thorough inspection of the food-supply before we can expect the best results.

Dr. J. M. Partridge, of Indiana, submitted a report of the

Committee on Cattle Disease which was received and adopted, and the committee continued under the name of Committee on Animal Diseases and Food, a motion of Dr. E. M. Hunt to that effect being referred to the Executive Committee.

Next followed the "Report of the Committee on Epidemic Diseases," an abstract of which is published on other pages of this number. The "Sanitation of the Mississippi Valley," by Dr. J. B. Thornton, also to be found in full on other pages. "The Present and Future of Water Analysis," by Major Charles Smart, United States Army, the "Pollution of the Upper Ohio and the Water-Supply of its Cities and Towns," by Dr. James E. Reeves, and the "Relation Between Underground Sewerage and Filth Diseases," by Dr. S. S. Herrick, which followed in this day's proceedings, have been published in full in immediately preceding numbers. The "Relation of the Depth of Water in Wells to the Causation of Typhoid Fever," by Dr. Henry B. Baker, will appear, in abstract, at least, in a subsequent number. Next followed a paper on the "True Value of Clinical Analysis in Determining the Hygienic Purity of Potable Water," by Dr. Thaddeus M. Stevens, of Indianapolis, Ind. And following this—

MR. LOMB'S LIBERAL PRIZE DONATION was announced and acted upon, as published in the October number.

Next followed a paper on the "Manufacture of Soda-water from Polluted Well-water," by Dr. Frank R. Fry, of St. Louis Medical College. Most of the manufacturers of fountain soda-water in this city use well-water. All of the wells from Chouteau to Cass Avenue, and from the river to Fourteenth Street, are contaminated by sewage. There is great difficulty in contending with this practice, owing to the fact that although impurities have been discovered in the wells, a sufficient amount has not been found to justify the Board of Health in taking legal action and in condemning and destroying the well. The most profitable plan would be, of course, to destroy and close up the wells, but the proprietors cannot see it in this light and fiercely resist the officers. It would therefore be of the utmost avail if this Society would stamp its approval upon the condemnation of the use of well-water in soda manufacture. Especially so, as the probability is that a similar state of affairs exists in other cities of the Union.

The concluding paper of the session was the "Chemical Disposition of Sewage," by Dr. W. John Harris, of St. Louis. The special points were: It has been stated that sewage would purify itself in three or four miles, but in London, in the river Thames, sewage was discovered fourteen miles from the place where it had been turned into the river. Mother earth is perhaps the proper disinfectant, but irrigation would not answer in clayey grounds. The most feasible process is now in use in Tottenham and Windsor—quicklime, potash, and coal tar being employed.

A lively discussion on the disposal of sewage followed, which was participated in by Drs. Hunt, of New Jersey; Harris, of St. Louis; Raymond, of Brooklyn; Bryce, of Ontario; Herrick, of New Orleans; Vaughan, of Michigan; Fee, of Kansas City; Mr. Moore, of St. Louis, and others.

The Evening Session was chiefly occupied by Major George M. Sternberg, Surgeon United States Army, on "Disease Germs," before an unusually full audience, who had every reason to be gratified with his interesting address. He dwelt particularly upon the morphology of the pathogenic flora, instancing their great variety of form and their modes of multiplication by fission, budding, etc. He spoke of his labors in the investigation of the causes of yellow fever while a member of the commission which was sent to Havana several years ago by the National Board of Health to study the nature of that disease in its habitat. The multudinous forms of bacteria, bacilli, spirilli were spoken of, with suggestions as to the effect on the human system of changes or evolutions in their lives. Mention was made of experiments on rabbits in the inoculation of gutter mud and septic matter from various sources and of different kinds, and the lecture concluded with the projection upon a screen of micro-photographs taken from life of various microbi, highly magnified. Among others, a specimen of the bacillus tuberculosis. Each specimen shown was explained and commented on, and the exhibition closed amidst hearty expressions of great satisfaction.

Dr. Bremer, of St. Louis, followed Dr. Sternberg, and as preliminary to his paper, the subject of which was "The Bearing of the Discovery of the Bacillus Tuberculosis on Public Health," he commented on the views expressed by the pre-

vious speaker, expressing his dissent thereto in a measure, and avowing a full belief in the views and claims put forth by Dr. Koch, of Germany. There were some people, he said, who denied that Koch's discovery marked a progress in practical medicine, because it had added nothing to the therapy of consumption. The latter assertion must be admitted as true. They treated phthisis to-day as they did before the demonstration of the tubercle bacillus. But there was one point gained that would prove of incalculable importance—the etiology of the disease being known, they could, in a measure, protect themselves from tuberculous infection. Consumption was a zymotic disease, which was both contagious and infectious. It might be transmitted directly from person to person, or indirectly by means of the atmosphere or food. The chief infectious material was dried tuberculous sputa. Care ought, therefore, to be taken to prevent the expectorations of consumptives from becoming dry and pulverized. It was dangerous to sleep in the same bed with a consumptive. Double beds ought to be discarded on general hygienic principles. People ought to be made aware of the existence of the disease. It did not benefit a patient or a patient's family to conceal the truth, especially since the dissecting table had revealed the fact that many patients recovered from phthisis. A well-founded hope of ultimate recovery might therefore be held out to patients.

Carpets in a sick-room were dangerous under all circumstances, but especially were they so in cases of zymotic disease, above all in consumption. In hotels and buildings of a public character, carpets ought to be abolished, because it was impossible to control their cleanliness and freedom from tubercular material. Raw beef should never be eaten, and milk should not be used in its raw state. Aside from certain diseases known to create a predisposition to consumption—measles and whooping-cough, for instance—insufficient and unwholesome food, overcrowding, debauches, want of ventilation and breathing space, were all close allies of the disease. They could not, by legislation or otherwise, prevent marriages between consumptives, although such marriages were, in a sense, immoral. Moral suasion and scientific conviction were both equally ineffectual in preventing such marriages. It was a fact, as common as it was deplorable, that those were most eager to propagate

their species who were least fitted for life, and least likely to give rise to a healthy and vigorous progeny. Again, there were the many depressing factors of our civilization, intimately connected and interwoven with our social, commercial, and industrial life, which all tended to pave the way for the invasion of the disease germ. To remove those factors would be to radically change our modern civilization—to realize the dreams of the most enthusiastic reformers—in short, it would be the establishment of the millennium. But much could be done to check and limit the disease by the means and precautions he had indicated.

Friday morning.—Fourth day and final session. After miscellaneous business and the election of new members, the first business in order was the report of the Advisory Council, election of officers, and the appointment of committees. Then followed the reading of several papers in abstract and by title, for want of time to hear them in detail, all of which were referred to Publication Committee, with power.

OFFICERS FOR ENSUING YEAR.

President, J. E. REEVES, M.D., Wheeling, W. Va.
First Vice-President, HON. ERASTUS BROOKS, N. Y.
Second Vice-President, Dr. H. B. BAKER, Lansing, Mich.
Treasurer, J. B. LINDSLEY, M.D., Nashville, Tenn.
Secretary, IRVING A. WATSON, M.D., Concord, N. H.

EXECUTIVE COMMITTEE.

Dr. H. P. WALCOTT, Cambridge, Mass.
Dr. CHARLES SMART, U.S.A., Washington, D. C.
Dr. G. B. THORNTON, Memphis, Tenn.
Dr. D. W. HAND, St. Paul, Minn.
Dr. GUSTAVUS DEVRON, New Orleans, La.
Dr. H. B. HORLBECK, Charleston, S. C.

Next Place and Time of Meeting:

WASHINGTON, D. C., December 7, 1885.—A vote of thanks was returned to the Dominion Government, and to the Ontario Board of Health for their invitation to hold the next meeting in Toronto.

ADVISORY COUNCIL.

Alabama, Dr. R. D. WEBB, Livingston.
Arkansas, Dr. J. A. DIBRELL, Little Rock.
California, Dr. F. W. HATCH, Sacramento.
Colorado, Dr. CHARLES AMBROOK, Boulder.
Connecticut, Prof. C. A. LINDSLEY, M.D., New Haven.
Delaware, Dr. L. P. BUSH, Wilmington.
Florida, Dr. R. B. S. HARGIS, Pensacola.
Georgia, Dr. W. H. ELLIOTT, Savannah.
Illinois, Prof. HOSMER A. JOHNSON, M.D., Chicago.
Indiana, Dr. E. S. ELDER, Indianapolis.
Iowa, Dr. W. S. ROBERTSON, Muscatine.
Kentucky, Dr. PINKNEY THOMPSON, Henderson.
Louisiana, Dr. S. S. HERRICK, New Orleans.
Maine, Dr. C. G. ADAMS, Portland.
Maryland, Prof. GEORGE H. ROHÉ, M.D., Baltimore.
Massachusetts, Dr. S. H. DURGIN, Boston.
Michigan, Dr. FOSTER PRATT, Kalamazoo.
Minnesota, Prof. C. M. HEWETT, M.D., Red Wing.
Mississippi, Dr. WIRT JOHNSTON, Jackson.
Missouri, Dr. JOSEPH SPIEGELHALTER, St. Louis.
New Hampshire, Dr. G. P. CONN, Concord.
New Jersey, Dr. W. K. NEWTON, Paterson.
New Mexico, Dr. W. T. PARKER, U.S.A., Fort Union.
New York, Dr. JOSEPH H. RAYMOND, Brooklyn.
North Carolina, Dr. THOMAS F. WOOD, Wilmington.
Ohio, Dr. R. HARVEY REED, Mansfield.
Pennsylvania, CROSBY GRAY, Esq., Pittsburg.
Rhode Island, Dr. CHARLES H. FISHER, Providence.
South Carolina, Dr. T. GRANGE SIMONS, Charleston.
Tennessee, Col. D. P. HADDEN, Memphis.
Texas, Dr. R. M. SWEARINGEN, Austin.
Vermont, Hon. HENRY D. HOLTON, M.D., Brattleborough.
Virginia, Prof. J. L. CABELL, M.D., University of Virginia.
West Virginia, Dr. T. A. HARRIS, Parkersburg.
Wisconsin, Dr. J. T. REEVE, Appleton.
District of Columbia, Major SAMUEL A. ROBINSON, Washington.
U. S. Army, Major GEORGE M. STERNBERG, M.D., Baltimore, Md.

U. S. Navy, Medical Director ALBERT L. GIHON, M.D., Washington, D. C.

U. S. Marine Hospital Service, Surgeon WALTER WYMAN, M.D., Baltimore, Md.

Bureau of Education, Hon. JOHN EATON, Commissioner, Washington, D. C.

The following preamble and resolutions were unanimously adopted:

Whereas, There may be an opportunity to represent to the people of the country through the World's Exposition at New Orleans such facts as it may be serviceable for them to know in relation to public health and sanitation,

Resolved, That a committee be appointed to confer with the management of the New Orleans Exposition relative to an exhibit in the interests of public health, and, if it seems to them desirable, to supervise the preparation of such exhibit.

Resolved, That the Advisory Council constitute this committee.

It is desired in the interest of public health that each member of the committee should endeavor to promote the object of the above resolution, that a sanitary exhibit creditable to this country may be secured. Full particulars may be obtained by addressing the management at New Orleans, or Hon. John Eaton, Commissioner of Education, Washington, D. C.

NATIONAL, STATE AND LOCAL BOARDS OF HEALTH REPORTS.

W. P. DUNWOODY, ESQ., hitherto Chief Clerk and Disbursing Agent of the National Board of Health, has recently been appointed a member of the Board in place of Professor Hosmer A. Johnson, M.D., of Illinois, resigned; and elected Secretary of the Board in place of Col. Waring, who resigned that position. The Annual Report of the National Board for 1883, just received, consists of the work for that year under the restraints of $67,500, placed at its disposal for all purposes—$50,000 being for aid to State and Local boards of health, and to local quarantine stations, in carrying out their rules and regulations to prevent the introduction and spread of contagious and infectious diseases. The details of service in the expenditure of this fund are chiefly comprehended in

the reports of officers in charge of the refuge stations at Ship Island and Sapelo, and the immigrant-inspection service for the prevention of the spread of small-pox. Besides the reports by the officers in charge of these stations and the immigrant-inspection service, the volume contains a number of important reports and papers from U. S. consuls and others abroad, on cholera and other epidemic diseases related to commerce. Laws relating to the National Board, Report of Committee on Epidemic Diseases, U. S. Senate; and Resolutions of State Boards and other sanitary organizations, together with memorials to the President of the United States and to Congress in support of the National Board of Health, are appended.

Congress appears to be the only body of intelligent officials in the United States, who fail to appreciate the importance of sustaining the National Board of Health. Possibly the great pecuniary losses to France and Italy, on account of a similar state of apathy and unreadiness to prevent the introduction of cholera in those countries last June, as that which now obtains in this country, may have the effect of stimulating effort.

ILLINOIS.—Appreciating the possible invasion of cholera, and with a view to such concerted action by the Local Boards of Health as may be most effectual for its prevention, the Illinois State Board of Health has incorporated its laws, rules and regulations into a well-arranged *Sanitary Code*, or Model Sanitary Ordinance, for the government of such Local Boards as already exist, and for the adoption of all communities which have not yet secured health organizations, throughout the State. Appended is a digest of the health laws in force, and a summary of specific information on practical sanitation for the benefit of health officers and others, applicable to all places.

MICHIGAN.—At the regular quarterly meeting of the Michigan State Board of Health, held at Lansing, October 7, 1884, Professor R. C. Kedzie presented nine samples of drinking-water taken from the public supplies of Bay City, West Bay City, Grand Haven, and Ludington, all of which showed large quantities of organic matter and other impurities. Professor Kedzie was granted till November 1st to complete his paper on "Potable and Culinary Waters in Michigan, with

Especial Reference to Contamination by Sawdust," for publication in the Report of the Board for 1884. He was also requested to make a special report on the use of explosive substances for heating and lighting purposes.

At the request of the Board of Corrections and Charities, committees were appointed to examine and report on the sanitary conditions of the State House of Correction at Ionia ; and on the sanitary bearings of the use of boiler-iron for cells in jails.

The Secretary continued his report on Outbreaks of Cheese-poisoning. Seven outbreaks in Michigan had been reported this year, in which there were 190 cases of sickness, but no deaths. The symptoms following the eating of the cheese were very similar in all cases, consisting of pain in the stomach, cramping of muscles, coldness of extremities, and great prostration, with violent retching and purging lasting for several hours. In most cases the larger the amount of cheese eaten the more violent were the symptoms. Samples of the Lowell cheese had an acid reaction and a peculiar strong odor, believed to be due to caprillic acid or caproic acid ; examined with a one-tenth inch immersion objective, this cheese was found to contain the mycelium of a mould, and to be swarming with several kinds of actively moving bacteria. Samples of the cheese were sent to Dr. V. C. Vaughan, of Michigan University, and to Professor T. J. Burrill, of Illinois State Industrial University, for further examination and experiment.

Further time was given to the Committee on Text-books on Physiology and Hygiene. The Secretary called attention to a sanitary house-to-house inspection which had been made recently in the city of Ann Arbor. It is believed that this is the first systematic inspection of the kind ever made in this State.

A paper on Typhoid Fever was presented by the Secretary, and was approved for publication in the Annual Report of this Board.

The State has been free from small-pox during the quarter.

The recent report that pleuro-pneumonia exists among cattle in the vicinity of Nashville, Mich., proved on inquiry to be unfounded. During the quarter glanders was reported present among horses in Delta County. Letters were sent to health officers or supervisors of all townships where the disease was reported to exist, urging prompt action on the part of the

Local Boards of Health to exterminate the disease. It is believed that there are fewer cases than were at first reported. As one result of the correspondence, two of the infected horses were shot by their owner.

The Secretary reported the preparation, publication, and distribution of 12,000 copies of the document on the Prevention and Restriction of Cholera. A similar document, on Cholera in its Relations to Railroads, had also been prepared at the request of the Commissioner of Railroads, and had been printed and distributed by the Commissioner, in connection with a circular from his office to all railroad officials in Michigan.

A list of the names and addresses of the health officers of Michigan has been printed and a copy sent to each Local Board of Health. The document on the Restriction and Prevention of Diphtheria has been revised with reference to new laws and reprinted. The new compilation of the Public Health Laws has been distributed to every health officer in the State, a class of persons who do not receive the Session Laws.

MASSACHUSETTS.—Forty-second Report to the Legislature of Massachusetts, relating to Births, Marriages, and Deaths in the Commonwealth, for the year ending December 31, 1883; together with the returns of Libels for Divorce for 1883. Under direction of the Secretary of the Commonwealth, with editorial remarks by Frank Wells, M.D. Estimated population for the year 1,985,335. There were recorded:

Births (besides 1,589 still births).....	47,285	=23.82 per 1,000
Marriages.....	18,194	= 9.16 "
Divorces.....	655	
Deaths.....	37,748	=19.01 "

The birth-rate, including still births, was 24.61, or .80 for still births alone, as compared with 24.53 and .77 for 1882.

For the first time since 1878, the number of children born of foreign parents exceeded those of native birth, the excess being 776, an increase of 1,329 over the statistics of the previous year. There has been a marked decrease in the percentage of native births since 1858. There has also been a steady increase in the number of children born out of wedlock, from 14.2 to 19 to every 1,000 births; the ratio in 1883 being the

highest ever recorded in the State, and nearly ten per cent. greater than in 1864.

Of divorces granted in 1883, there was an increase over the previous year of 140 or 27.2 per cent., and over the yearly average for the past twenty-one years, 48.5 per cent. or nearly one-half; 1 to 27.7 of the marriages as against 1 to 34.3 in 1882, and 1 to 33.1 as the average for the previous twenty-one years.

Deaths reported for the year, 37,748—an increase of 963 over the previous year. Rate per 1,000 of population, 19.01 —.13 of one per cent. lower than for previous year; .51 of one per cent. less than for 1881; .21 of one per cent. lower than the average for the five years previous; and .25 of one per cent. lower than the mean for thirty years previous to 1881.

Of the mortality among infants under one year of age, which always increases the death-rate to a great extent, the percentage (19.89) was less than that of any year, except in 1878 and 1879, since 1872; and 1.95 below that of the average for the previous twelve years. These results taken in connection with 1,635 more births in 1883 than in 1882, and moreover, that the percentage of deaths from zymotic diseases was less than for any year in the last twelve, it will be seen that the health for 1883 was exceptionally good.

In proportion to the total mortality, consumption holds the first rank in all the counties, and pneumonia the second in ten out of the thirteen; the number of deaths from the former was 5,931, and from the latter, 3,045. As compared with the statistics of former years, there was a decrease in the number of deaths from consumption, .12 of one per cent. less than in 1882, and .05 of one per cent. less than in 1881. Pneumonia increased—113 more than in 1882.

Of zymotic diseases, from diphtheria and croup, there were 1,621 deaths—150 less than for the preceding year. From measles, 321—greater than in any year of the last twenty-four. The number from scarlatina was 575—also considerably greater than for the year 1882 (318), but with an estimated rate per 10,000 of 2.9 in comparison with 6.5 for the average of the last twenty-two years. From small-pox, there were five only the smallest, with the exception of 1878, since 1853. Typhoid fever caused 860—equal to 4.3 per 1,000 of the population,

and less than the average for the last twenty-six years; only for three years, 1877, 1878 and 1879, during this period, has the mortality from typhoid fever been less. The proportionate decrease for the State is equal to 21.9 per cent.—a result which is attributed in a great measure to the work of the State Board of Health.

NEW YORK.—Monthly Bulletins for August and September give total reported mortalities of the entire State, with the causes, for August, 6,950. Percentage of infant mortality, 35.8—nearly the same as for July. Twenty-two of the 24 cities in the State return an average death-rate of 21.21 per 1,000. For September, 9,647 deaths reported. Percentage of infant mortality, 43.2. Percentage from diarrhœal diseases, 21.2; croup and diphtheria, 3.2; typhoid fever, 2.3; acute respiratory diseases, 6.7; consumption, 12.5. About half of the entire mortality is reported from the four cities, New York, Brooklyn, Rochester, and Albany, having an aggregate population of 2,200,000; they show an infant mortality of about forty-eight per cent. The Bulletin is incomplete. Returns from Buffalo and Watertown, and a considerable number of the larger villages, for this month not received. The highest death-rates in the category for the month were: Lima, 42.85; Cooperstown, 36; Palmyra, 35; New Lots, 34 59; Oneonta, 33.60; Walton, 33.33; Newtown, 32.40; Schenectady, 32.47; North Hempstead, 31.50; Long Island City, 29.62.—The lowest: Tonawanda, 4.80; Crown Point, 5.58; Hempstead, 6; Camden, 7.6; Cobleskill, 7.12; Hector, 7.20; Worcester, 8; Sweden, 8.43; Southold, 8.33; Geddes, 8.56; Cohoes, 9; Saugerties, 9.

TENNESSEE.—October Quarterly Meeting of the State Board was the first under the recent reorganization. Dr. J. D. Plunket, President, and Dr. J. Berrien Lindsley, Secretary and Executive Officer. The special subjects of action were the promotion of measures for the prevention of cholera and the arrest of small-pox. In regard to the former, circulars of information have been freely distributed throughout the State, and local boards of health urged to energetic action for the removal of all inviting conditions.

Small-pox continues to crop out at different places, and

gives much trouble by obstruction to travel and expense, chiefly due to the half-hearted measures in the respective communities for stamping it out, by prompt and complete isolation and vaccination. A committee was appointed to make personal and thorough inspection of the public school system and buildings, and measures taken to secure daily ozone observations throughout the State by the aid of the United States Signal Service.

ST. LOUIS.—Seventh Annual Report of the Health Commissioner for the fiscal year ending April 1, 1884.—This report comprehends the reports of the several Superintendents of the Hospitals, Insane Asylum and Poor-house, the Clerk of the Board of Health, Steward of Quarantine and Small-pox Hospital, Physician in charge of the City Dispensary, and Chief Sanitary Officer, with full details of the administration of their several trusts, and embraces a large amount of valuable statistical information, with tabular statements, in which are to be found all the facts that are of interest in an inquiry involving due care of the public property and economy in its expenditure.

During our recent visit to St. Louis, we gladly availed ourselves of the courtesy of the Health Commissioner and his accomplished deputy to observe for ourselves, the admirable keeping of most of the institutions here enumerated—all except the quarantine and small-pox hospital and the city dispensary—of the condition of these we may justly infer from the rest.

The City Hospital and Insane Asylum, though groaning under the fault of overcrowding, common to most of the public institutions of the large cities in the United States, are models of executive skill and administrative ability on the part of their respective Superintendents, Drs. D. V. Dean and Charles W. Stevens. And but for this, and in spite of it, ere long, if measures be not speedily taken for relief, the overcrowded, semi-decayed wards and halls and old walls are in a condition well calculated to invite and promote disease of whatever kind.

The Female Hospital and Poor-house are in a far less favorable condition, though surprisingly well kept under the

circumstances. To the dangers incident to overcrowding, these institutions add criminal neglect of proper house drainage. The Poor-house in particular presents a sad picture of all sorts of human misery—dumb and deaf, idiotic, insane, malingerers, unfortunate and honest poor—packed with skill: a sad blot on the fair side of a beautiful city and a lavish municipality in some other respects.

The tables of mortality, reported by Dr. G. W. Carson, Clerk of the Board of Health, show a slight increase of mortality over the previous year, the death-rate being 20.4, as against 19.6. The city is said to have been entirely free from epidemics for the year, though the deaths from diphtheria, scarlatina, croup, and whooping-cough aggregate 1,013—172 less than for the previous year. Deaths from typhoid fever, 135; malarial fevers, 273; puerperal fevers, 74.—Total deaths from all causes, 7,989; 2,575, or nearly one-third, from zymotic diseases; 3,420 were of children under five years of age.

BOSTON.—Twelfth Annual Report of Board of Health, for fiscal year, ending April 30, 1884.—Total number of deaths reported (exclusive of 504 still births), 9,740—an increase of 745 over the previous year, and over each of the ten previous years. Death-rate 21.91. Percentage of deaths from preventable causes to the total mortality 26.19, being an increase of .89 over the previous year, but a decrease of 1.42 when compared with the previous ten years. Number under five years of age, 3,358—42.98 per cent. of the total.

The *Disposal of Wastes* continues to be a feature of practical work with this Board, to a degree surpassing that of any other in the United States. The amount realized from the sale of house offal is $35,000 yearly. Other wastes are variously disposed of. For house-dirt, street-sweepings, sawdust, shavings, oyster, clam, and lobster shells, small dead animals, and rubbish in general, cremation is urged as the best means. In promoting this, an illustrated description of Fryer's Patent Destructor is given, and a statement of the work accomplished by its use in the city of Leeds, Eng., during the year 1879. The apparatus has been adopted in Kralingen, Leeds, Heckmondwike, Blackburn, Bradford, Warrington, and Derby. The cost of an efficient Destructor is about £4,500.

Several burial-grounds are still kept open, under an annual appropriation of $5,000 for their supervision, all of which the Board of Health urges should be closed.

In the summer of last year action was taken by the Board for the erection of a warehouse for the treatment and temporary storage of imported rags or other material deemed to be dangerous to the public health, and to this end a building has been erected and equipped, on Gallop's Island, and a quarantine order promulgated requiring its use, and the temporary detention of all vessels and persons bringing such cargoes, subject to the written permit of the port physician.

PROVIDENCE, R. I. — Twenty-ninth Annual Report of Births, Marriages, and Deaths, for the year 1883, Edwin M. Snow, M.D., City Registrar.—Births, 2,916—128 more than in 1882; married, 2,345—10 more than for preceding year; and deaths (exclusive of 162 still-born), 2,328—86 more than for preceding year. Estimating the population at 116,755, the ratios per thousand of births, marriages, and deaths were, respectively, 24.42, 19.71, 19.50.—The percentage tables show that of all deaths in twenty-eight years, from known causes, 16.58 per cent. were from consumption; during last ten years, it has not exceeded 16.15. Croup, 1.51; diphtheria, 2.33; diarrhœa and dysentery, 3.23; typhoid fever, 5.51. "The severe epidemic of typhoid fever in the autumn of 1882 was renewed in March and April, 1883. . . . The result was that in the whole year 1883 there were 128 deaths from this disease, a greater number than was ever before known in a single year, except in 1882. . . . Typhoid fever is especially a disease of the autumn, and its annual increase at that season is always expected."—Pneumonia, 8.79 per cent. of all. "This disease is one of the most important in this climate, and has destroyed on an average for twenty-eight years, 7.52 in each 100 of all the decedents in the city."

DETROIT, MICH.—Third Annual Report of the Health Officer, July, 1884.—This report is deficient in that explicitness of statement in regard to population and death-rate, common to health reports generally, the Health Officer leaving "each one to form his own estimate of population and reach a corresponding percentage of mortality by a very simple mathe-

matical process" for himself. A note is appended, stating that the census of the State, nearly complete, will show that the population of Detroit has been over, instead of under-estimated. This being so, the claim that Detroit is "among the foremost cities in healthfulness" will not be sustained. For even now, estimating the population at 140,000, the number of deaths reported for the year, 3,062, shows an annual rate of 21.8 per 1,000, considerably in excess of several other cities less favorably situated. But the accomplished Health Officer is no apologist for unsanitary conditions. The continued shoaling of the water around the docks by the accumulation of sewage silt, to a degree which chokes several of the main sewer outlets, "bad plumbing, faulty drainage of buildings, stagnant pools of water in vacant lots, sewage in cellars, manure heaps, foul vaults, sewer gas in houses, etc.," and the usual concomitants of an increasing ratio of preventable diseases, are all brought to the attention of the civil authorities, not for the first time, though still neglected—possibly because they are told, notwithstanding, that "Detroit is among the foremost cities in healthfulness." Of the total mortality, 3,062, 1,050 or *more than one-third* were caused by zymotic disease; of these 343 were by diphtheria, 104 by croup, 35 by typhoid fever, 43 by scarlatina, 325 by diarrhœal diseases. This extraordinary excess of deaths from preventable diseases is not an indication of a healthful city.

TOLEDO, O.—Annual Report of Board of Health for 1883. —Births reported "over 1,000," and for the first time exceeding the death returns, though still incomplete; marriages, 688; deaths, 821—13.24 per 1,000 in a population estimated at 62,000. 337 were of children under five years of age. Deaths from zymotic diseases, 206—a little over one-fourth of the whole number, but 43 less than in 1882. During the year there were 29 cases of diphtheria reported, 18 of which proved fatal. Of this disease the Health Officer remarks: "About two-thirds o. all the cases reported have been on premises without a sewer. There were 20 deaths from typhoid fever; and as related to this disease: There are "scattered throughout the city, hundreds of wells varying from twelve to forty feet in depth . . . frequently the cause of much sickness from being contaminated by neighboring cesspools."

MORTALITY STATISTICS IN THE UNITED STATES.

MONTH OF OCTOBER, 1884. Correspondents under this head will please send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
*Boston, Mass., 427,940	680	313	181	64	14	..	17	35	..	53	23.5
*Lowell, Mass., 68,500	87	27	14	1	..	..	..	5	..	4	16.5
*Worcester, Mass., 58,295	103	36	18	8	..	..	..	6	..	13	22.9
Providence, R. I., 120,000	205	75	32	9	11	..	1	17	..	13	20.5
New Haven, Ct., 75,000	108	37	24	10	..	..	2	9	..	9	17.3
New York, N. Y., 1,356,958	2,543	1,208	794	209	19	26	51	131	..	301	22.4
Brooklyn, N. Y., 644,526	1,181	548	274	79	8	4	19	60	..	149	21.9
Long Island City, N. Y., 21,000	47	31	15	9	..	..	2	1	..	3	26.8
Yonkers, N. Y., 22,000	41	16	12	1	..	..	..	2	..	4	22.3
Albany, N. Y., 97,344	148	52	39	16	2	..	2	5	..	8	18.2
Cohoes, N. Y., 20,000	7	4	2	3	..	..	..	1	..	...	4.2
Troy, N. Y., 60,000	70	26	21	4	..	..	..	5	..	4	14.0
Syracuse, N. Y., 65,000	66	12	15	5	..	..	..	5	..	...	12.2
Utica, N. Y., 39,000	76	25	16	3	..	..	1	6	..	4	28.3
Auburn, N. Y., 26,000	31	9	10	..	..	..	..	..	..	3	14.3
West Troy, N. Y., 13,000	17	7	5	..	..	..	1	2	..	3	15.6
Rochester, N. Y., 101,000	146	56	28	17	1	..	..	14	..	18	17.3
Kingston, N. Y., 20,000	22	10	5	1	..	..	..	1	..	3	13.2
Newburgh, N. Y., 20,000	26	7	7	..	..	..	1	..	..	2	15.6
Poughkeepsie, N. Y., 20,207	33	11	12	2	1	..	..	2	..	1	19.6
Oswego, N. Y., 24,000	28	9	5	..	..	..	..	1	..	1	14.6
*Hudson Co., N. J., 209,000	385	150	72	24	12	..	10	15	..	32	23.8
Paterson, N. J., 57,000	...	...	...	...	...	...	...	...	...	...	.....
§Philadelphia, Pa., 927,995	710	273	128	60	4	2	2	36	..	30	20.3
†Pittsburg, Pa., 180,000	185	106	34	31	6	..	..	11	..	32	17.3
Erie, Pa., 36,768	37	17	2	2	..	..	..	1	..	3	12.0
Wilmington, Del., 51,500	128	53	10	25	..	..	1	11	..	3	29.0
*Cincinnati, O., 280,000	403	147	76	15	4	6	1	10	..	40	18.7
†Cleveland, O., 200,429	265	148	34	7	3	21	2	19	..	54	22.9
Toledo, O., 52,000	81	32	14	12	..	..	1	4	..	9	18.7
Detroit, Mich., 140,000	265	142	31	42	1	..	1	28	..	37	22.2
Evansville, Ind., 40,000	...	...	..	..	..	..	..	...	..	...	....
*Rock Island, Ill., 11,650	15	7	3	2	2	..	..	1	..	...	16.6
Chicago, Ill., 630,000	910	443	141	104	20	1	11	53	..	88	16.0
St. Louis, Mo., 400,000	685	295	83	67	10	..	1	61	..	75	20.5
Milwaukee, Wis., 150,000	245	89	29	11	6	2	1	13	..	31	19.6
Salt Lake City, Utah, 25,000	36	12	4	..	1	..	..	4	..	3	21.3
San Francisco, Cal., 235,000	380	84	70	7	4	..	..	23	..	12	19.3
Minneapolis, Minn., 100,000	133	62	20	12	..	..	2	22	..	8	15.9
St. Paul, Minn., 100,000	103	40	18	8	..	..	3	14	..	4	12.3
*Baltimore, Md., 408,520	621	244	113	64	3	..	10	32	..	36	19.7
Dist. of Columbia, 200,000	368	124	77	7	6	..	9	54	..	20	22.0
Richmond, Va., 73,400	161	54	24	1	1	..	2	14	..	13	25.7
†Lynchburg, Va., 23,000	33	10	5	..	..	..	..	2	..	3	24.8
*New Orleans, La., 234,000	448	116	74	17	..	..	1	55	..	33	24.4
Nashville, Tenn., 50,000	94	28	13	6	..	..	3	8	..	7	22.5
Mobile, Ala., 31,295	76	28	9	1	..	..	..	12	..	1	29.0

* 4 Weeks, October 25th; †3 weeks; § 2 weeks.

MORTALITY STATISTICS ABROAD.

FOUR WEEKS. ENDING OCT. 25, 1884.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Typhoid and Typhus Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,019,361.....	5,652	1,377	796	146	91	49	49	74	44	217	18.3
Liverpool, 573,202.....	1,118	307	...	13	18	39	22	21	2	72	25.3
Glasgow, 517,941.....	984	215	157	24	48	38	32	39	1	52	24.7
Birmingham, 421,258...	656	214	...	5	8	5	25	9	1	63	20.3
Dublin, 351,014.....	754	126	107	17	22	..	8	22	..	43	28.0
Manchester, 338,296....	643	184	...	3	6	3	9	9	..	41	24.8
Leeds, 327,324.....	612	189	...	7	22	4	19	26	..	37	24.4
Sheffield, 300,563.....	601	166	...	1	26	2	6	10	..	53	21.7
Edinburgh, 246,703....	333	80	47	10	7	..	14	12	..	17	17.5
Belfast, 216,622.....	346	73	59	6	16	..	4	9	..	23	20.7
Bristol, 215,457.....	326	96	...	3	1	..	4	7	..	14	19.7
Bradford, 209,564.....	312	90	...	2	8	7	9	4	..	27	19.4
Hull, 181,225.....	293	90	...	1	3	8	4	10	1	36	21.0
Newcastle, 151,325.....	302	81	...	..	14	1	4	4	..	20	26.5
*Havre, 105.867.....	186	43	9	8	..	..	..	3	1	22	30.5
Reims, 93,823.....	219	62	21	5	..	..	..	12	..	51	30.3
†Nancy, 74,954.....	55	7	3	1	..	..	..	5	..	3	19.1
Breslau, 290,000.....	619	212	45	18	9	6	1	8	..	77	27.6
Brussels, 171,293.....	297	68	39	10	5	2	2	7	1	54	22.5
Cologne, 150,513.....	274	87	35	3	1	1	10	3	4	24	23.5
*Christiana, 122,000....	151	36	16	8	10	..	2	..	..	15	17.2
FOUR WEEKS ENDING OCTOBER 18, 1884.											
Frankfort, 145,100.....	197	51	12	4	3	1	4	2	..	18	17.4
Hanover, 131,200.....	216	75	14	1	1	5	..	3	..	24	21.4
Bremen, 119,561.....	176	74	14	1	3	..	2	6	..	17	19.1
Dantzic, 116,162.....	223	91	13	10	13	1	..	3	..	39	24.8
Stuttgart, 109,937.....	157	60	13	3	..	2	5	4	..	23	18.5
Strasbourg, 110,739....	174	70	15	2	..	1	3	3	..	44	20.1
Dusseldorf, 105,287....	169	86	9	2	1	2	3	5	..	33	20.4
Nuremburg, 105,176....	206	94	19	6	..	5	..	1	..	51	25.4
Chemnitz, 102,713.....	337	124	10	13	8	..	3	5	..	5	29.0
Magdeburg, 105,000....	204	69	11	12	4	2	..	5	..	15	25.8
Elberfeld, 101,000.....	177	51	8	4	2	7	1	1	..	8	19.4
Barmen, 100,000.....	144	38	8	6	1	5	..	1	..	16	18.7
Altona, 97,000.....	201	69	21	8	8	1	2	1	..	33	26.9
Aix-la-Chapelle, 89,116.	166	69	22	1	..	1	5	3	..	13	26.6
Mayence, 64,120.....	101	32	6	3	3	1	1	4	..	14	17.6
Amsterdam, 350,202....	701	....	...	29	57	10	14	57	..	6	25.2
Rotterdam, 166,001....	290	....	...	8	16	3	3	16	..	2	22.7
The Hague, 131,417....	219	....	...	10	2	1	1	2	..	4	21.6
Lyons, 376.613.....	588	....	79	3	..	2	2	14	..	52	20.5
Berlin, 1,225,065.....	2,490	968	131	206	51	20	46	26	..	397	26.4
Hamburg, 486,678.....	914	276	58	43	8	6	9	7	..	148	24.4
Dresden, 236,000.....	379	135	24	23	5	8	14	1	..	35	20.8
Munich, 240,000.....	474	213	31	9	5	10	5	2	..	98	25.6
Leipzig, 164,636.....	244	83	21	30	9	4	3	2	..	20	19.2
Kœnigsburg, 154,000...	308	137	26	13	14	..	..	5	..	53	25.1
*Bucharest, 200,000....	247	77	16	11	17	1	2	6	..	19	24.4
Paris, 2,239,928.....	3,604	564	228	98	10	64	14	64	3	355	21.1
§Calcutta, 433,219.....	719	....	...	..	..	..	..	267	..	25‖	22.6

* 3 weeks; † 2 weeks; § 4 weeks ending September 13th; ‖ cholera.

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH ENDING OCTOBER 31, 1884.

Arrival.	Vessels.	From.	Passengers.	Deaths.	Births.
Oct. 3,	America,	Liverpool,	669	1	1
" 5,	Gen. Werder,	Bremen,	807	1	2
" 5,	Fulda,	"	873	3	
" 8,	Braunschweig,	"	514		1
" 10,	Oder,	"	449	2	
" 10,	Silesia,	Hamburg,	448	1	
" 11,	Westphalia,	"	550		1
" 13,	Eider,	Bremen,	683		1
" 15,	Bohemia,	Hamburg,	536	2	
" 18,	Werra,	Bremen,	874	1	
" 18,	Weiland,	Hamburg,	780		1
" 19,	California,	"	431	3	1
" 21,	Rhaetia,	"	555	1	
" 22,	Westerland,	Antwerp,	621	1	
" 22,	Devonia,	Glasgow,	339	1	
" 26,	Hapsburg,	Bremen,	822	1	
" 26,	Elbe,	"	1051		1
" 26,	Germanic,	Liverpool,	529	1	
" 28,	Frisia,	Hamburg,	466		1
" 30,	Anchoria,	Glasgow,	231	1	
" 31,	Rhein,	Bremen,	715	2	
" 31,	Indiana,	Glasgow,	142		1
			13,085	22	11

A DESERVED COMPLIMENT.—At the recent meeting of the American Academy of Medicine, an organization whose primary object is the advancement of Medical Education in the United States, and whose membership exclusively consists of alumni of respectable institutions of learning and honorary members, Medical Director A. L. Gihon, United States Navy, was chosen President. Dr. Gihon is, and has been for many years, among the foremost promoters of medical education in the United States, and the Academy honors itself in thus honoring him.

A Typhoid Fever Nursery.

From a Report of the Health Officer on Enteric Fever in the city of Yonkers, N. Y., made to the Board of Health, 1884, we learn that a certain portion of a ward of the city, known as Nodine Hill, an elevated rocky ridge, with a damp subsoil of varying depth from one inch to four feet, except where it is all solid rock, was in October, 1883, when typhoid fever was first reported among them, chiefly occupied by a number (the report does not say how many) of factory operatives and mechanics. Their water-supply consisted of "about six wells, some of which had to be abandoned on account of the bad taste of the water, and others refused to give water during the summer months. There is one exception, however, . . . the Brook Street public well, within three feet of an old water-course, which served to receive surface drainage formerly, but now receives, in addition, the liquid contents of several privy vaults and cesspools, and all the polluted subsoil drainage from" a certain part of the hill. "This well is only ten feet deep, built of loose stone, and contains water to a depth of six feet. The water in this well was considered the best on the hill, and during the summer months was used by not less than forty families in the neighborhood." How long this condition had obtained previous to October, 1883, when the first case of typhoid fever, a school-girl, ten years old, was reported, is not stated. "The most careful investigation failed to reveal any definite cause." Yet "the house in which this case occurred was found" with "a damp cellar, uncemented, ill smelling, and badly ventilated. . . . The family consisted of six persons, mostly factory hands. The family vault is about thirty-five feet from the dwelling, is poisonous and offensive, no cesspool, slops thrown on yard or into vault, which was provided with an overflow pipe leading to the street gutter in front of the premises. The patient and other members of the family drank water from the Brook Street well." Thirty additional cases followed in the same neighborhood, nearly all in families who used water from the Brook Street well, and obtained milk and meat in the same vicinity; and who occupied houses with surroundings similar to the one described—some of them worse. Notwithstanding, "about November 20th, a gentleman of the most profound microscopical knowledge volunteered the statement that, "after

careful examination, the water of the public pump on Brook Street is pure and wholesome, and is not the cause of typhoid fever or any other fever or disease," and advised against closing the well. But, as measured by the results, the Health Officer was very properly not satisfied.

"On the 26th of November a sample of the water in the Brook Street well was expressed to Professor C. F. Chandler for chemical analysis, and on the 7th of December the following communication was received from Mr. Chandler:

"'CERTIFICATE OF ANALYSIS.

"'NEW YORK, December 6, 1883.

"'SIR: The sample of water submitted to me for examination contains in one U. S. gallon of 231 cubic inches—

Appearance	Clear, bluish green.
Odor, heated to 100° Fahr.	Pungent, due to large amount of ammonia.
Chlorine in chlorides	4.284 grains.
Equivalent to sodium chloride	7.039 "
Phosphates	Much.
Nitrates	Trace.
Nitrogen in nitrates and nitrites	0.945 "
Free ammonia	0.484 "
Albuminoid ammonia	0.035 "
Oxygen absorbed at 80° Fahr. in 15 minutes	0.1124 "
Oxygen absorbed at 80° Fahr. in 3½ hours	0.2239 "
Hardness equivalent to carbonate of lime before boiling	5.325 "
Hardness equivalent to carbonate of lime after boiling	5.132 "
Organic matter	7.115 "
Mineral matter	20.936 "
Total solids	28.051 "

"'This water is exceedingly bad, being charged with sewage matters. Respectfully, your obedient servant,

"'C. F. CHANDLER, PH.D.

"'To VALENTINE BROWNE, M.D.,
Health Officer, Yonkers, N. Y.'"

The well was closed, and—

"In proof of the soundness of this polluted water theory, no more convincing evidence can be produced than the fact that not a single case of enteric fever has been reported since the well has been closed."

Whether the hill has been cleansed by the abrogation of other filthy conditions, or left to well up another outbreak of typhoid fever from the criminal neglect of conditions which gave rise to it in the first place, we are not informed.

"HEARTH AND HOME" HALE.—The notorious quack, W. H. Hale, who was driven out of West Virginia a year ago for his vile practices, is again on the bounce for obtaining money on false pretences, in Washington, this time, for guaranteeing to cure a case of pulmonary consumption, for which he obtained $100 in advance of the patient's death. He has been sentenced to pay back the money, but appears to be left free to find other dupes.

ST. PAUL, MINN.—A good example: Dr. Henry F. Hoyt, who has shown his efficiency as Health Officer, by strict attention to the duties of the office, has had his salary increased to $3,000 and quarters provided in the City Hall. Under his immediate superintendence and the auspices of a State Board always alive to conditions in conflict with the public health, St. Paul is likely to receive the attention which it deserves as one of the foremost cities of the Northwest.

ANOTHER $500 PRIZE.

CHICAGO, October 1, 1884.

The Citizens' Association of Chicago offer a prize of $500 for the best practical essay on the Main Drainage, Sewerage, and Water Supply systems of Chicago and its vicinity. It is desired that the essays shall discuss the subject in view of the present condition of those systems, and shall consider the best method of providing for the immediate and also the future requirements of the population in those respects. The question should be considered in connection with the Chicago River and the slips; the Des Plaines River and the Ogden Ditch; the Canal and the Fullerton Conduit, and should have special reference to a mode of securing an abundant supply of pure water, and of providing for the disposition of the sewerage. All suggestions of plans for carrying into effect the views of the writers should have due regard both to efficiency and economy, and should be accompanied by descriptive drawings, so far as necessary to make them easily understood. The subject should embrace the city of Chicago and such of its suburbs as may properly use the same means of obtaining water and the same systems or lines of drainage.

The competing essays must be delivered to the Secretary of the Association on or before April 1, 1885, and be signed

by some designation corresponding with the mark upon a sealed envelope, which shall contain the name and address of the writer.

All essays are to be considered the property of the Association for purposes of publication, but the envelopes containing the names of the writers will be destroyed without being opened, excepting that bearing the designation of the successful essay.

JOHN L. THOMPSON, *President.*

J. C. AMBLER, *Secretary.*

THE CONTAGIOUSNESS OF INEBRIETY.—The climax of absurdity in regard to inebriety appears to have been reached. In a recent number of the *Alienist and Neurologist*, Dr. Crothers, assuming that inebriety is a disease, classifies it among contagious disorders, and ventures to illustrate his conclusion by the citation of cases, and pretends to trace its analogy to measles and other zymotics, but he omits to take note of the difference in the environments.

A STRONG SCORE IN FAVOR OF CREMATION.—At the recent meeting of the London Health Exhibition, Sir Spencer Wells is credited with having cited an outbreak of scarlatina, caused by the digging up of some graves in a country churchyard, where the bodies of some persons who had died of scarlatina thirty years before were buried. No other source could be discovered in this case, hence it is difficult to avoid the inference that the infection *retained its vitality in the graves for thirty years.*

AN INTERNATIONAL HEALTH EXHIBITION IN NEW YORK.—Our esteemed contemporary, *The Medical Record*, after remarking upon the wonderful success of the recent International Health Exhibition in London, which drew a grand total of 4,167,000 visitors, or 27,000 daily, urges attention to the lesson taught, which Americans can not and *ought not* to ignore, that the United States is fully ripe for a repetition of such a convention, and that New York is, of all places, the most appropriate for it. There is no room to doubt that the educational benefit of such an exhibition held in New York would be of immense value to the health of the people, and a financial success to all who would engage in it.

OBITUARY.

EDWARD JARVIS, A.M., M.D., died at Dorchester, Mass., on Friday, October 30th, aged nearly eighty-one years, after a brief illness. He was born in Concord, Mass., January 9, 1803. He graduated from Harvard College in 1826, and received his degree of A.M. from the same institution in 1829, and his degree of M.D. from the Boston Medical School in 1830. He at once entered upon the practice of his profession in Northfield, Mass., but two years afterward moved to Concord, where he remained until 1837, when he went to Louisville, Ky., where he practised until 1842. He then returned to Concord, and shortly afterward moved to Dorchester, where he had for many years an extensive practice, and became widely known as a contributor to the leading periodicals on subjects related to social science and hygiene, and the author of one of the first books on school physiology. He was an active member of numerous scientific associations and societies, connected with various eleemosynary institutions and hospitals, wrote papers on idiocy, intemperance, insanity, hospitals, vital statistics, etc., which attracted deserved attention. He made a sanitary survey of Massachusetts, and presented the results in a volume of nearly 300 pages in 1855. He tabulated the statistics of mortality in the United States census of 1860. He was highly respected by all who enjoyed his acquaintance, and his good works are a lasting memorial of one of the pioneers of sanitary science. He was married January 9, 1834, to Almira Hunt, of Concord, Mass., who survived him only two days. She died Sunday, Nov. 2d, aged eighty years—and both were buried in the same grave.

LITERARY NOTICES.

MECHANICS' AND ENGINEERS' POCKET-BOOK OF TABLES AND FORMULAS PERTAINING TO MECHANICS, MATHEMATICS, AND PHYSICS. By CHARLES H. HASWELL, M.A.S.C.E., etc. *Forty-Sixth Edition.* New York: Harper & Brothers.—In this handsome pocket-book volume of 922 pages, there is a

vast amount of practical information clearly and concisely presented. It is a revision and entire reconstruction of preceding editions, with much new matter added. The tables are clear, and for the most part arranged to form a ready reference. Over fifty pages are given to the subjects of hydraulics and hydronamics, which include many useful formulas to assist the engineer. The chapter on limes, cements, mortars, and concretes is materially taken from Gillmore's treatise on the subject, which is the best authority. There are other chapters on masonry, sewers, naval architecture, heat, the steam-engine, etc., making this compact volume the most complete pocket-book of its kind we know of, and its usefulness commends it to all practical engineers in every sphere.

ILLUSTRATED POEMS OF OLIVER WENDELL HOLMES.—Dr. Holmes is a favorite with everybody, and his poems are too well known to need any repeated special notice in our pages. This holiday volume of selected poems is elegantly gotten up in a style which does credit to the publishers. It is superbly illustrated from designs by Frederic Crowninshield, Rose Turner, F. P. Vinton, H. B. Jones, and others. One of the most elegant, as it would doubtless be one of the most valued holiday gift-books published. Boston: Houghton, Mifflin & Co.

VISIONS OF FANCY. A Poetical Work, by N. M. Baskett, M.D. 12mo, pp. 120. St. Louis, Mo.: The Author.—A book of upward of a hundred poems, most of which appeal to the kindliest emotions, and may be read with comfort by all who believe in a higher and better hereafter in the life to come.

MEDICAL RHYMES. A Collection of Rhymes of ye Ancient Times, and Rhymes of the Modern Day, Rhymes Grave and Rhymes Mirthful, Rhymes Anatomical, Therapeutical, and Surgical, all sorts of Rhymes to Interest, Amuse, and Edify all sorts of Followers of Esculapius. Selected and compiled from a variety of sources, by Hugo Erichsen, M.D., Professor of Neurology in the Quincy School of Medicine, Medical Department of Chaddock College; Licentiate of the Royal College of Physicians and Surgeons of Kingston, Canada; Member of the Detroit Medical and Library Association; Corresponding Member of the Natural History Society of Wisconsin,

etc. With an Introduction by Professor Willis P. King, Sedalia, Mo. Illustrated. 8vo, pp. 218. St. Louis, Mo., Chicago, Ill., and Atlanta, Ga.: H. Chambers & Co.

With the very full title-page of this book, no further notice is necessary. It would be more satisfactory, however, if more pains had been taken in tracing the selections to their true sources, instead of crediting them, as many are, to that mean class of publishers who publish selections as their own.

HEALTH. An Address by Norman Chevers, C.I.E., M.D., F.R.C.S. Eng., President of Health Department, Social Science Congress, Birmingham, 1884.—This is a timely application of the anticipations of cholera to local conditions, in and about various places in the vicinity of London, and of universal application.

PREVENTION OF PUERPERAL INFECTION. By Henry J. Garrigues, A.M.,M.D., Visiting Obstetric Surgeon to the New York Maternity Hospital. Reprint from *Medical Record.*—This paper of a year ago was one of the first to show the practical method of using the bichloride of mercury for the control of puerperal fever. Its more extensive use since by many persons confirms the conclusions of Dr. Garrigues, but the results in some cases have been such as to suggest that it should be used very carefully.

MUMPS AS A CAUSE OF SUDDEN DEAFNESS, by Leartus Conor, A.M., M.D., Ophthalmic Surgeon to Harper Hospital, Detroit, Mich.; a pamphlet reprint from *American Journal of the Medical Sciences*, showing the importance of special attention to the most common of all complications to a disease which is too often regarded as trivial.—JEQUIRITY, in the Treatment of Trachoma, by the same author, is a pamphlet reprint from the Detroit *Lancet.* He concludes that the active principle of jequirity is some kind of a ferment or alkaloid, and not a bacillus, as some have supposed.

INDIANA PHARMACEUTICAL ASSOCIATION PROCEEDINGS, 1884, Joseph R. Perry, Secretary, Indianapolis. Hasselman Journal Co., Indianapolis.—A report which bears evidence of a progressive association no less in the scientific aspect of pharmacy than in trade. An appendix of nearly a hundred pages

on Queries and Pharmacy, with reference to a great variety of preparations and compounds, is full of interest to physicians as well as pharmacists.

THE PHRENOLOGICAL JOURNAL AND SCIENCE OF HEALTH, besides being the only periodical devoted to phrenology, and containing everything of interest pertaining to that subject, is alive to household hygiene, and particularly to vegetable and fruit food and cookery—both entertaining and profitable reading for every household.

TRANSACTIONS OF THE MEDICAL SOCIETY OF STATE OF NEW YORK, 1884. 8vo, pp. 547. Published by the Society. William Manlius Smith, M.D., Secretary, Syracuse, N. Y.

The annual meeting, February 5th to 7th, of which this volume gives the proceedings, was eventful in what may be considered a split in the Society, on account of the final adoption of the new Code of Ethics, the secession of a considerable number of the active members, and their formation of a new society—the New York State Medical Association, which held its first annual meeting recently in New York. The volume before us contains a full report of the discussion, and a record of the final vote by which the new Code, which had been adopted the year before, was sustained—two hundred and twenty-nine delegates and permanent members voting. The whole number registered at this meeting was upward of two hundred and fifty—one of the most numerously attended meetings the Society has ever held. The committee reports and papers which compose the volume are not up to the average value of previous volumes, probably because of the absorbing interest of the *code*, which induced a larger attendance than usual, but less attention to scientific work. The sanitary reports and papers we have already published in full, vol. xii., pp. 158–162, 314–324.

This Society may now be regarded as on its metal to sustain its well-earned reputation as being one of the foremost State medical societies in the country for scientific work, face to face with its vigorous offshoot—the New York State Medical Association—which has just held its first and singularly successful annual meeting. The forthcoming meeting in February, proximo, will doubtless attract the attention of the

medical profession generally, with a view to the practical results of New Code procedure, and the ability of the profession to susta in two State societies.

A SUPERB GIFT-BOOK.—*Messrs. James R. Osgood & Co.* have established a cosmopolitan rather than a national reputation alone in their illustrated holiday gift-books. To the technical facilities of a great house they have added the finest artistic taste in selecting and presenting the graphic portions of the work, and pictures and poems blend into an harmonious unity. This elegant holiday line of gift-books began in 1881 with "Lucile," followed by "The Princess," the "Lady of the Lake," and now by the noble poem of "MARMION." It is an interesting bit of inside literary history to hear the methods adopted to secure these pictures, that are really portraits of places.

Special artists employed by the Osgood house have passed months in Scotland under the direction of Mr. A. V. S. Anthony, and the sketches are made with absolute fidelity to the scenes.

The archæological details of figures and composition of groups and genre are very finely considered, and that these details are worked out by such artists as Garrett, Fredericks, Fenn, Schnell, and Merrill is a fact sufficient to indicate their quality. The very atmosphere of the days of chivalry lingers in the pages of the "Marmion" of this year, and the knightly surroundings are admirably depicted. The figure-pieces from Mr. Fredericks are especially a delight, so strong and impressive are they. Not with less exquisite art are wrought the landscapes. Here panorama after panorama unfolds itself before us as we turn the pages, the light resting on Cheviot Peak, the "castled steep" of Norham, Whitby's "cloistered pile," the quiet loveliness of Loch Vennachar, the Denby Hills, and Bothwell's turrets; and the "uncultured breast" of Blackford, and "the till of Twisel Bridge"—all these and more are given to us in revelations of wild Scottish beauty. The dedication of each canto is arranged with emblematic border in daintiest design, and the head and tail pieces scattered through the book are marvels of decorative beauty. Never had a poem of stately and immortal beauty a more fitting setting, and Messrs. Osgood & Co. are to be congratulated on having produced a pictured poem that is a perpetual and ever-renewing joy and delight.

THE EFFECTS OF SEA AIR UPON DISEASES OF THE RESPIRATORY ORGANS, a paper read before the American Climatological Association, Washington, May 5, 1884, by Boardman Reed, M.D., of Atlantic City, N. J., purports to show the advantages of *sea* air, by observations at Atlantic City. With all that the author says of the advantages of sea air and how it differs from the moist air over damp soils, we fully agree; but with due allowance for the favorable situation of Atlantic City, as compared with other sea-coast towns, we fail to see how it, or any sea-coast air whatever, can fairly illustrate the effects of *sea* air. We are inclined to attribute all the benefits of a winter residence at Atlantic City, as compared with other places of the same latitude, to the difference in altitude and temperature, a relatively clean soil moisture and cleanly surroundings.

Hotel Brighton, at Coney Island, we are glad to observe, also advertises winter accommodations for invalids and others. We have no question that the well-appointed hotels of both Atlantic City and Coney Island possess advantages for tender lungs, infinitely superior to any of the close rooms of city houses in the same latitude.

CALENDARS FOR 1885.—*Holmes Calendar.* A new Calendar for 1885, containing Selections from the Writings of Oliver Wendell Holmes, for every day in the year. Mounted on a card, exquisitely decorated from designs by Dora Wheeler.

This is the first Calendar which has ever been compiled from Dr. Holmes' writings, and it will be valued by his many admirers not only for the daily messages from him which it will bring, but for its artistic appearance as well. The card on which it is mounted, of oblong shape, bears a capital portrait of Dr. Holmes, on each side of which stands a group of maidens bearing rose-garlands, with which they are decorating it. The design is illuminated in gold and colors, blended with delicate effect.

Emerson Calendar. A Calendar for 1885, containing Selections newly arranged and revised from Mr. Emerson's Writings, for every day in the year. Mounted on a card beautifully decorated in colors from designs by Miss Florence Taber.

The new decorations of this Calendar include an excellent portrait of Emerson, and the symbolic pine-tree also appears

in the design. A border of conventionalized pansies runs across the top, and the whole effect of the coloring is as deep and rich as are the sentences which the Calendar contains.

Longfellow Calendar. A Calendar for 1885, with newly arranged Selections from Longfellow's Writings, for every day in the year. Mounted on a card, beautifully decorated in colors, from designs by Frederic Crowninshield.

A remarkably good medallion portrait of Longfellow is a feature of the Longfellow Calendar, and this portrait is upon the front of a sculptured stone, upon which the Genius of Poetry is just placing a laurel wreath. The subdued coloring of this Calendar is especially in harmony with the taste of the day.

Whittier Calendar. A Calendar for 1885, with Selections from Whittier's Works, for every day of the year. Mounted on a card artistically decorated in colors from designs by T. de Thulstrup.

Two graceful figures—one, Maud Muller in the hay-field; the other, Mabel Martin on a snowy hill-side—decorate the Whittier Calendar, which, in common with the other Calendars, contains a portrait of the author from whom its selections are taken, in this case mounted on a decorated entablature. The coloring of this card is bright, and the profuse use of gold in the decoration makes it peculiarly brilliant. Each Calendar is twelve by eight inches in size. Price, $1.00 each. Boston, Mass.: Houghton, Mifflin & Company.

THE SANITARIAN.

Prospectus for 1885.

WITH this December number THE SANITARIAN closes its twelfth year and thirteenth volume, having been increased in size to *two volumes* a year, and with such accumulated strength as will abundantly fortify the promise to keep the place which has been awarded it, of being the foremost periodical in the English language in the presentation and discussion of all subjects relating to the prevention of disease and the promotion of health.

Based at the outset upon medical knowledge and naval ser-

vice, over an extensive field of observation in various climates in different quarters of the world, large experience in dealing with epidemic diseases, and practical sanitation for the maintenance of health under the most trying circumstances, THE SANITARIAN has been foremost in educating the people on quarantine, drainage, civic cleanliness, school hygiene, and other leading sanitary questions which now occupy public attention.

As THE SANITARIAN has been hitherto, it will continue to be in the future: Devoted entirely to the promotion of the art and science of sanitation, mentally and physically, in all their relations; by the investigation, presentation, and discussion of all subjects in this large domain, as related to personal and household hygiene, domicile, soil and climate, food and drink, mental and physical culture, habit and exercise, occupations, vital statistics, sanitary organizations and laws: in short, everything promotive of or in conflict with health, with the purpose of rendering sanitation a popular theme of study and universally practical.

SUBSCRIBERS—all of whom THE SANITARIAN regards as personal friends—are particularly invited to take heed of the lapse of time. *Subscriptions for another year are now due*, and the more promptly they are received, the better able we shall be to turn them to good account. And may we not hope from every one that kindly and neighborly interest, to which the regular reading of THE SANITARIAN has so often given expression, that it ought to be in the hands of every family in the land? Right confident are we that if every one of its regular readers would take a little pains to make its value known to his neighbors, he would thereby very materially aid us in the promotion of the health and happiness of the people and secure to himself the gratification of a good deed.

SUBSCRIPTION ORDERS will be found on an advertising page, for the convenience of subscribers, who, we trust, will make such prompt use of them as to render stated bills unnecessary.

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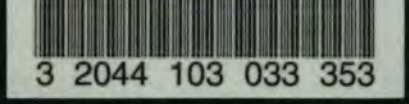
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